Department of Radiology-Annual Executive Summary Report-July 1, 2003 to June 30, 2004

Vijay M. Rao, M.D.
3D Diffusion Tensor Imaging of brain tumor
DEPARTMENT OF RADIOLOGY

The Mission of the Department of Radiology is to provide quality imaging and to continually improve our services.

Our goals are to:

- Provide quality service to patients and referring physicians
- Continue to grow successfully in an increasingly competitive market
- Operate in an efficient, productive, and cost effective manner
- Maintain excellence of our educational programs
- Continue to stay at the cutting edge of imaging research
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DEPARTMENT OF RADIOLOGY

Vijay M. Rao, M.D.
Professor and Chairman

Christopher R.B. Merritt, M.D.
Vice Chair for Information Technology

Barry B. Goldberg, M.D.
Vice Chair for Research

2003-2004

DEPARTMENT CLINICAL DIVISIONS AND DIRECTORS

BODY COMPUTED TOMOGRAPHY/ABDOMINAL IMAGING
Laurence Needleman, M.D.

BREAST IMAGING/AMBULATORY RADIOLOGY
Catherine W. Piccoli, M.D.

CARDIOVASCULAR/INTERVENTIONAL RADIOLOGY
Joseph Bonn., M.D.

MAGNETIC RESONANCE IMAGING
Donald G. Mitchell, M.D.

MUSCULOSKELETAL AND GENERAL DIAGNOSTIC RADIOLOGY
William B. Morrison, M.D.

NEURORADIOLOGY/HEAD AND NECK RADIOLOGY
Adam E. Flanders, M.D.
David P. Friedman, M.D.

NUCLEAR MEDICINE
Charles M. Intenzo, M.D.

ULTRASOUND
Barry B. Goldberg, M.D.

METHODIST HOSPITAL DIVISION
Larry A. Caputo, M.D.

DEPARTMENTAL COMMITTEES AND CHAIRMEN

ADVISORY COMMITTEE
Alfred B. Kurtz, M.D.

CONTRAST COMMITTEE
Laurence Needleman, M.D.

EDUCATION COMMITTEE
Levon N. Nazarian, M.D.

INFORMATICS COMMITTEE
Christopher R.B. Merritt, M.D.

PERFORMANCE IMPROVEMENT COMMITTEE
Stephen Karasick, M.D.

RESEARCH COMMITTEE
Barry B. Goldberg, M.D.

RESIDENCY SELECTION COMMITTEE
Levon N. Nazarian, M.D.
RADIOLOGY DEPARTMENT FACULTY RANK
2003-2004

PROFESSORS
Adam E. Flanders, M.D.
Flemming Forsberg, Ph.D.
Barry B. Goldberg, M.D.
Ethan J. Halpern, M.D., M.S.
David Karasick, M.D.
Stephen Karasick, M.D.
Alfred B. Kurtz, M.D.
Anna S. Lev-Toaff, M.D.
Donald G. Mitchell, M.D.
Levon N. Nazarian, M.D.
Vijay M. Rao, M.D.
Mathew L. Thakur, Ph.D.

RESEARCH PROFESSOR
Christopher R.B. Merritt, M.D.

ASSOCIATE PROFESSORS
Oksana H. Baltarowich, M.D.
Joseph Bonn, M.D.
David J. Eschelman, M.D.
Rick I. Feld, M.D.
David P. Friedman, M.D.
Geoffrey A. Gardiner, Jr., M.D.
Charles M. Intenzo, M.D.
Song Lai, Ph.D.
William B. Morrison, M.D.
Laurence Needleman, M.D.
Lisa M. Tartaglino, M.D.
Pamela Van Tassel, M.D.

CLINICAL ASSOCIATE PROFESSOR
Catherine W. Piccoli, M.D.

RESEARCH ASSOCIATE PROFESSORS
Ji-Bin Liu, M.D.

ASSISTANT PROFESSORS
Diane C. Bergin, M.D.
Diane Deely, M.D.
W. Scott Enochs, M.D., Ph.D.
Carin F. Gonsalves, M.D.
Sung M. Kim, M.D.
Nancy Lee, M.D.
Patrick L. O’Kane, M.D.
J. Antoni Parellada, M.D.
Ana M. Salazar, M.D.
Sharon R. Segal, D.O.
Rosita M. Shah, M.D.
Adam C. Zoga, M.D.

CLINICAL ASSISTANT PROFESSORS
Valerie Gilliam, M.D.
Patti J. Herling, M.D.
Cindy Isaacscon, M.D.
Lynn Lucas-Fehm, M.D.
Dinesh Sharma, M.D.
Terri Tuckman, M.D.
Annina N. Wilkes, M.D.
Elaine Wolk, M.D.
Jean K. Yi, M.D.

RESEARCH ASSISTANT PROFESSOR
Laurence Parker, Ph.D.

INSTRUCTORS
Dan Beideck, M.S.
Susan DeWyngaert, M.D.
Demetrius H. Bagley, M.D., Associate Professor of Urology [primary]  
Associate Professor of Radiology [secondary]

Robert L. Brent, M.D., Ph.D., Professor of Pediatrics [primary]  
Professor of Radiology [secondary]

Ralph A. Carabasi, M.D., Professor of Surgery [primary]  
Professor of Radiology [secondary]

Paul J. DiMuzio, M.D., Assistant Professor of Surgery [primary]  
Assistant Professor of Radiology [secondary]

Robert H. Rosenwasser, M.D., Professor of Neurosurgery [primary]  
Instructor of Radiology [secondary]

Stanton N. Smullens, M.D., Professor of Surgery [primary]  
Associate Professor of Radiology [secondary]

Paul Walinsky, M.D., Professor of Medicine [primary]  
Assistant Professor of Radiology [secondary]
DEPARTMENT OF RADIOLOGY
Vijay M. Rao, M.D., Chairman

CLINICAL DIVISIONS 2003-2004

Body Computed Tomography/
Abdominal Imaging

Directed by Laurence Needleman, M.D.
Drs. Rick Feld, Ethan Halpern, Patti Herling, Stephen Karasick, Alfred Kurtz, Anna Lev-Toaff, Levon Nazarian, Patrick O’Kane, Ana Salazar, Rosita Shah

Breast Imaging/Ambulatory Radiology

Directed by Catherine W. Piccoli, M.D.
Drs. Susan DeWyngaert, Valerie Gilliam, Cindy Isaacson, Lynn Lucas-Fehm, Annina Wilkes, Elaine Wolk

Cardiovascular/Interventional Radiology

Directed by Joseph Bonn, M.D.
Drs. Joseph Bonn, David Eschelman, Goeffrey Gardiner, Jr., Carin Gonsalves

Magnetic Resonance Imaging

Directed by Donald G. Mitchell, M.D.
Drs. Diane Bergin, David Karasick, William Morrison, Patrick O’Kane, J. Antoni Parellada, Catherine Piccoli, Adam Zoga

Musculoskeletal and
General Diagnostic Radiology

Directed by William B. Morrison, M.D.
Drs. Diane Bergin, Diane Deely, Patti Herling, Cindy Isaacson, David Karasick, Stephen Karasick, Donald Mitchell, J. Antoni Parellada, Ana Salazar, Rosita Shah, Dinesh Sharma, Adam Zoga

Neuroradiology/ENT Radiology

Directed by Adam Flanders, M.D., David Friedman, M.D.
Drs. W. Scott Enochs, Nancy Lee, Vijay Rao, Dinesh Sharma, Lisa Tartaglino, Pamela Van Tassel, Jean Yi

Nuclear Medicine

Directed by Charles M. Intenzo, M.D.
Dr. Sung Kim

Ultrasound

Directed by Barry B. Goldberg, M.D.
Drs. Oksana Baltarovich, Rick Feld, Ethan Halpern, Alfred Kurtz, Anna Lev-Toaff, Christopher Merritt, Donald Mitchell, Levon Nazarian, Laurence Needleman, Patrick O’Kane, Catherine Piccoli, Sharon Segal, Terri Tuckman, Annina Wilkes

Research

Drs. Flemming Forsberg, Song Lai, Ji-Bin Liu, Laurence Parker, Mathew Thakur, and Mr. Daniel Beideck
### DEPARTMENT OF RADIOLOGY
### HOUSESTAFF ROSTER
### 2003-2004

#### RESIDENTS

<table>
<thead>
<tr>
<th>First Year Residents</th>
<th>Second Year Residents</th>
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<tbody>
<tr>
<td>Joseph O. DeJesus, M.D.</td>
<td>Lauren W. Averill, M.D.</td>
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<tr>
<td>Michael V. Dutka, M.D.</td>
<td>Sachin Dheer, M.D.</td>
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<tr>
<td>Alan R. Hammond, M.D.</td>
<td>Ronald J. Dolin, M.D.</td>
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<tr>
<td>Hilary M. Hochberg, M.D.</td>
<td>Elizabeth H. Hsu, M.D.</td>
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<td>Bradley G. Leypold, M.D.</td>
<td>Christopher T. Kirkpatrick, M.D.</td>
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<tr>
<td>Susan Sung, M.D.</td>
<td>Dayna Levin, M.D.</td>
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<td>John D. York, M.D.</td>
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<th>Third Year Residents</th>
<th>Fourth Year Residents</th>
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<tr>
<td>Justin T. Blum, M.D.</td>
<td>Raymond Chang, M.D.</td>
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<tr>
<td>John S. Farrell, M.D.</td>
<td>Steven G. Finden, M.D.</td>
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<tr>
<td>Candace M. Howard-Claudio, M.D.</td>
<td>Laura H. Lee, M.D.</td>
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<td>Laura A. Klein, M.D.</td>
<td>Matthew A. Marcus, M.D.</td>
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<tr>
<td>Geoffrey L. Manton, M.D.</td>
<td>James T. Traiforos, M.D.</td>
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<tr>
<td>Imran M. Omar, M.D.</td>
<td>Steven C. Wagner, M.D.</td>
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<td>Suken H. Shah, M.D.</td>
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<tr>
<th>Nuclear Medicine</th>
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<tbody>
<tr>
<td>Gunsel Acikgoz, M.D.</td>
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<td>Kanchan P. Kulkarni, M.D.</td>
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#### FELLOWS

<table>
<thead>
<tr>
<th>Breast Imaging</th>
<th>Musculoskeletal</th>
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<tbody>
<tr>
<td>Brian S. Englander, M.D. (07/03-12/03)</td>
<td>Holly C. Gil, M.D.</td>
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<td></td>
<td>Nastaran Fatemi, M.D.</td>
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<td>Joseph B. Furlong, M.D.</td>
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<tr>
<th>Body MRI</th>
<th>Neuro/ENT</th>
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<tr>
<td>Nicole L. Glynn, M.D.</td>
<td>Qiang Li, M.D.</td>
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<td>Jaysheel J. Mehta, M.D.</td>
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<td></td>
<td>Waseem Ullah, M.D.</td>
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<tr>
<th>Body/Neuro MRI</th>
<th>US/CT/MRI</th>
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<tbody>
<tr>
<td>Glen J. Ha, M.D.</td>
<td>Salvatore Caminito, M.D.</td>
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<tr>
<td>Kenneth S. Kurtz, M.D.</td>
<td>Janine M. Dodds, M.D.</td>
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<tr>
<td>Tariq A. Quraishi, M.D.</td>
<td>Haroon H. Durrani, M.D.</td>
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<tr>
<td>Polya Samardar, M.D.</td>
<td>Shabnam A. Fidvi, M.D.</td>
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<td>Bhuvana Kittusamy, M.D.</td>
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<td>Joshua D. Mamelak, M.D.</td>
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<td>Ashu Sharma, M.D.</td>
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<th>Cardiovascular/Interventional</th>
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<tr>
<td>Colin A. Dodds, M.D.</td>
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<td>Hai Hoang Kenney, D.O.</td>
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This second year of my chairmanship of the Department of Radiology has been gratifying in many respects. We have begun major renovations to our physical plant and a significant upgrading of our equipment, which will result in better and more efficient patient care. We have made some important new faculty recruitments at a time when this is very difficult. The faculty has maintained our strong research and educational programs despite an ever-increasing clinical workload.

Some of the issues I identified in last year’s report have been satisfactorily resolved. Nevertheless, some problems remain which will be discussed in the report. On the whole, it has been a good year for the department, and there are many people to thank for it. I would like to thank JoAnn Gardner for her loyalty and outstanding assistance, Victor Sarro for his hard work and knowledge of the business and operations of radiology, and Andrea Maitino for her truly amazing work ethic and her ability to multitask, including excellent assistance in compiling this report. I also wish to acknowledge the assistance of Chris Merritt for spearheading and successfully completing multiple initiatives in clinical informatics, and Barry Goldberg for his assistance in advancing the research mission of the department.

Reflections of the key events of the past year and upcoming planned initiatives reveal a promising bright future for the department.

This report will address the key events of the past year in the following areas:

1) Department Organization
2) Clinical Activities
3) Planned New Clinical Programs
4) Clinical Weaknesses
5) Clinical Informatics
6) Educational Programs
7) Research Accomplishments
8) Research Weaknesses
9) Opportunities for Extramural Funding
10) Affiliations and Interdepartmental Activities
11) Department Administration
12) Department Goals
13) Issues for the College, University and Hospital

Vijay M. Rao M.D.
Professor and Chair
DEPARTMENT ORGANIZATION

During the past year, the department functioned effectively with the hybrid structure combining modality-oriented and organ system-oriented divisions. Dr. William Morrison was appointed Director of the Division of Musculoskeletal and General Diagnostic Radiology and Dr. Joseph Bonn was appointed Director of the Division of Cardiovascular/Interventional Radiography. Senior leadership of the department was streamlined with two Vice Chairs, Dr. Christopher Merritt for Informatics and Dr. Barry Goldberg for Research. The administrative infrastructure of the department was reorganized to increase efficiency and effectiveness of the clinical practice. In the past, Victor Sarro had total responsibility for both the department’s physicians’ practice plan and all clinical operations. Mr. Richard Blob was promoted to the position of Associate Administrator for Clinical Operations and has assumed direct responsibilities for clinical operations. In addition, Mr. Peter Natale was promoted to the position of Administrative Manager for Informatics. He also continues to serve as Chief Technologist for CT/MRI. I am confident that the administrative infrastructure will become streamlined with the appointment of these two outstanding individuals.

CLINICAL ACTIVITIES

The past year was a strong year, with the results of the hard work and dedication of the department beginning to show. We performed 265,125 procedures in hospital facilities and showed a 9% growth in the practice as compared with last fiscal year. More complex types of imaging studies, such as MRI, CT, and nuclear medicine, continue to replace conventional radiography procedures. In general radiology, chest x-rays increased by 5.7% and bone and abdominal radiography remained stable, while fluoroscopic studies decreased by 7.7%. There was substantial growth in body CT, including chest CT, with an 11% growth in both inpatient and outpatient activity. In neuroradiology/head and neck radiology there was an 18% increase in CT, but neuro MRI revealed a 6% decrease. Myelography continued to fade with a 52% drop, although demand for lumbar punctures under fluoroscopy continued to increase. There was a 3% decrease in body MR and an 11% drop in musculoskeletal MRI. Breast imaging showed a 6.6% increase in diagnostic mammography procedure volume, but a 7% decrease in screening mammography volume. There was an overall growth of 20% in nuclear medicine, primarily inpatient cardiovascular nuclear studies. Endocrine, GI, and GU studies also revealed a slight increase, but there was a substantial drop in brain and abscess imaging. Both ultrasound and cardiovascular interventional radiology remained stable with a slight increase in inpatient activity.

Jefferson Center City Imaging (JCCI), our outpatient-imaging center, had an extremely successful year with 20,460 procedures being performed. The center is well managed by Outpatient Imaging Affiliates, LLC, with their aggressive marketing efforts producing positive results. Targets have been exceeded in PET, CT, MRI, and ultrasound, although conventional radiography and DEXA scanning remained below projection.

In body CT, acquisition and installation of a second prototype 16 channel multidetector CT scanner on the 3rd floor of the
Gibbon Building has allowed us to begin to offer coronary CT angiography, cardiac CT, and CT colonography. Additionally, there continues to be a change in clinical practice, making CT a first line test for many complaints. CT is now the modality of choice to evaluate for suspected pulmonary embolism, suspected urologic disease, and more emergency patients who present with abdominal pain. The use of CT angiography and CT perfusion imaging have continued to expand neuroradiology/head and neck radiology services and the new consultation and reading rooms in JHN and COB have facilitated those increased clinical activities.

In the musculoskeletal and general diagnostic radiology division, the new multi-detector CT, as well as access to the interventional area, have further expanded musculoskeletal interventional procedures such as arthroplasties, CT arthrograms, radiofrequency ablation of bone metastases, biopsies, vertebroplasty, and spinal and paraspinal therapeutic injections. In the breast imaging center, a digital mammography unit was acquired, providing state-of-the-art breast screening. Additionally, utilization of the new Suros Atec Vacuum Assisted Biopsy Device for ultrasound, stereotactic and MRI guided breast biopsies has improved the technique for this minimally invasive approach to evaluating breast abnormalities.

The nuclear medicine division began using the Philips Axis gamma camera dual-headed detector system with variable angle geometry and attenuation correction capabilities, both of which optimize the quality of stress myocardial perfusion SPECT imaging. New clinical services in the division include radioimmunotherapy of non-Hodgkin's lymphoma using Zevalin (Yttrium-90 labeled monoclonal antibodies) and radioiodine therapy of widespread metastatic well-differentiated thyroid cancer using Thyrogen (human recombinant thyroid stimulating hormone). Clinical applications of FDG-PET imaging continued to expand with the number of cases imaged continuing to increase steadily. In CVIR, utilization of procedures such as chemooembolization, immunooembolization, and uterine fibroid embolization continued to grow and the use of retrievable vena cava filters and thoracic aortic stent-grafts have begun to provide our patients with the most advanced devices.

In ultrasound, Hitachi, GE, and Siemens have provided us with their top of the line ultrasound equipment with unique capabilities such as elastography to measure the hardness of tissue and voice command to increasing efficiency of performing studies. In addition, we have arranged to obtain two portable ultrasound units from GE, one of which will be placed in CVIR to aid needle guidance into vessels and abscesses. Levon Nazarian, MD, has continued to expand both diagnostic and therapeutic musculoskeletal applications of ultrasound. There has also been an increase in the clinical use of 3D ultrasound imaging in obstetrics and gynecology under the guidance of Anna Lev-Toaff, MD.

Our satellite centers represent an important component of our clinical practice. They provide a large volume of interesting case material, which benefits our training programs as well as generating significant additional revenue. Open MRI volume endured despite tumultuous times from uncertainty of contract renewal. Doylestown MRI stabilized after facing increasing competition and regained its market share. MRI volume at Langhorne MRI center revealed a 5% growth but it
continued to drop at Bala MRI center. A new management company, InSight Health, has acquired these centers and further expansion is anticipated. Overall, our practice at Academy Imaging Center remained strong.

**PLANNED NEW CLINICAL FACILITIES AND PROGRAMS**

The renovations of the 3rd floor of the Gibbon building and the 10th floor of the Main building are underway and will be completed in the spring of the upcoming year. A new 3 Tesla MR unit will be installed on the 3rd floor of the Gibbon building, as well as a new 1.5 Tesla magnet that will be acquired as a replacement for the outdated unit currently on 10 Main. This equipment will reduce the waiting time for exams, as well as allow us to provide state-of-the-art examinations to the Jefferson community. The renovations in the Gibbon building will improve and expand the outpatient registration and waiting area to provide a warmer, more patient-friendly environment. The space in the inpatient waiting area will be increased to optimize nursing supervision of critical patients and patients recovering from invasive procedures. Additionally, consolidated reading rooms will be created, allowing us to provide a more efficient service to our referring physicians. The renovations on 10 Main will increase the effectiveness of Radiology administration by providing a consolidated area for all administrative functions of the department, as well as physician offices. The departmental library for residency education will also be relocated to 10 Main. This is a challenging, yet exciting time for the department. The anticipated timeline for completion of the project is one year.

At the breast imaging center, Thomas Jefferson University Hospital leadership has targeted expansion of the breast cancer program with support through fundraising. The Development Committee of the TJUH board has endorsed the concept and preliminary plans have been proposed, including consolidation of the diagnostic and screening mammography services in renovated space at the medical office building. Additionally, expansion of screening mammography procedures is planned with increased digital mammography throughput and the addition of a new faculty member. In CVIR, the interventional group will introduce new techniques such as endovenous laser therapy for vein ablation and radiofrequency ablation of renal and skeletal tumors. We have not been able to proceed with these procedures in the past due to faculty shortage.

In **nuclear medicine**, development of a cardiac PET service is planned due to the higher sensitivity and specificity of PET compared with myocardial SPECT imaging for myocardial ischemia. In addition, capabilities for both oncologic and neurologic PET imaging will increase with CMS' approval expected in the upcoming year for evaluation of multiple myeloma, and patients with Alzheimer's dementia and related disorders. Zevalin, the radioimmunotherapeutic agent for non-Hodgkin's lymphoma, is expected to be approved by the FDA in 2005, which will provide new treatment options for certain chronic leukemias that are refractory to standard therapy.

In **body MRI**, coronary MR angiography and cardiac MR services for evaluation of ischemic heart disease will be offered once the installation of the new 3T and 1.5T magnet is complete. We will also be able to greatly expand our MRA capabilities, particularly for peripheral vascular disease, improving the quality of the studies and reducing the examination
time. In the **musculoskeletal and general diagnostic radiology division**, referrals for musculoskeletal CT is expected to increase for new imaging procedures such as arthroplasty and CT arthrography.

In **ultrasound**, the utilization of diagnostic and therapeutic musculoskeletal ultrasound is expected to grow from the increasing recognition throughout the greater Delaware Valley of our department as being a leader in the field. Plans are in progress to establish a women's imaging center concept for outpatients, which will provide an integrated program for women’s imaging including gynecology, obstetrics, sonohysterography and mammography as well as bone density evaluations. In the upcoming year, it is expected that some ultrasound contrast agents will be approved for clinical use. We should be able to rapidly integrate the contrast-enhanced procedures into our clinical activities based on our strong research efforts in this area.

In the **body CT division**, our goal is to become a regional training center for cardiac CT imaging. Drs. Ethan Halpern and David Levin are leaders in the field of cardiac imaging and are currently exploring state-of-the-art CT imaging procedures. The MDCTs, with faster higher resolution isotropic scanning, will continue to increase patient throughput and increase the volume of outpatients seen. We also expect to expand our new coronary angiography and CT colonoscopy services. In **neuroradiology/head and neck radiology**, increased volume of CT perfusion imaging and CT angiography is expected. Additionally, the 3T MR unit will provide advanced imaging technology including functional MRI and Diffusion Tensor Imaging for epilepsy and spinal cord injury.

### CLINICAL WEAKNESSES

We face several challenges in our clinical operation. Although we have continued to move forward with the acquisition of a second MDCT, the Philips Axis gamma camera, and a digital mammography unit, the replacement of the only in-house MRI and installation of the new 3T have been further delayed until the ‘05 fiscal year. As a result, we have continued to be limited in our clinical and research capabilities during the past year.

With ongoing advancements in CT and MRI technology, the on-line image processing needs to be improved in order to demonstrate images in an optimal manner. There remains to be inadequate technologist support for the post-processing of complex CT and MR datasets. The burden of time consuming and complex post-processing has been the responsibility of radiologists. Technologists need to be provided training to become superusers, ensuring the radiologists don't become the limiting factor in delivery of timely service. Our PACS continues to be a limiting factor in optimal utilization of a computed radiology system.

We are delighted about the renovations that have begun on 3 Gibbon and 10 Main, as well as the new patient consultation rooms which have been created in the COB and JHN for the Neuroradiology division, yet similar efforts are needed in other areas of the department. There remains a lack of space in nuclear medicine on 8 Thompson and ultrasound on 7 Main. The space occupied by nuclear medicine is suboptimal with no holding area for inpatients. Patients are in wheelchairs and stretchers in the hallway around the reception desk, making the area chaotic. This is a particular problem for the cardiac inpatients, whose stretchers span
the hallway of 8 Thompson. This area is in dire need of new state-of-the-art equipment and facility expansion to improve the patient's experience, thereby maintaining the strong outpatient practice in this hospital setting. In the breast imaging center, there is limited, cramped space, which adversely impacts the effectiveness of the staff and faculty. Efficiency would be improved by consolidation of the screening and diagnostic mammography services in renovated space.

There continues to be a nationwide manpower shortage in radiology. Recruitment of new faculty has become increasingly difficult, as we cannot compete with the higher paying academic institutions and privately owned outpatient centers. The vacancies in CVIR, thoracic radiology, and breast imaging have increased physician workload. The demand for 24 hours a day, 7 days a week radiology services are challenging while also providing interpretation by subspecialty experts to meet the expectations of the referring physicians. In addition, the faculty has less academic time to learn new procedures resulting in only a few faculty members who are relied upon for particular procedures, such as US-guided RF ablation.

CLINICAL INFORMATICS

During the academic year 2003-2004, we made significant progress in the transition to a fully digital operation. This involved five major informatics initiatives involving computed radiography (CR), the radiology information system (RIS), reporting and transcription using speech recognition (SR), enterprise distribution of images, and picture archiving and communications (PACS). In addressing its responsibilities, the Informatics Committee under the leadership of Christopher Merritt, M.D., in concert with the Informatics Technical Team, established the following goals early in the academic year:

- Increase availability of diagnostic images for clinicians
- Improve departmental efficiency and productivity
- Improve reporting turnaround time
- Reduce film printing expense
- Create a framework for integrated delivery of diagnostic imaging services and data through planning at the institutional rather than the departmental level, and strengthen interaction with hospital information technology leadership.

Related to these goals, five major objectives were successfully addressed in 2003-2004.

Replacement of conventional film-screen radiography with Computed Radiography

Of the imaging procedures offered by the Department of Radiology, all but conventional radiography and mammography involve digital data acquisition, display, and storage. A program to replace conventional film-screen radiography with computed radiography (CR) using digital receptor technology was begun in 2002-2003. During 2003-2004, CR was extended to include the emergency department (December 2003) and the neonatal intensive care unit (May, 2004), making our department almost completely filmless. This has resulted in a reduction in expense related to the purchase, processing, and handling of film, and has permitted the distribution of radiographic images throughout the hospital to multiple users simultaneously. The only
remaining areas of the department using film for primary image acquisition are the operating rooms and mammography. Conversion of these to CR will be a goal for 2004-05.

Implementation of enterprise-wide web-based image distribution
An advantage of an all digital imaging department is the opportunity to distribute images electronically to multiple users in multiple locations simultaneously. With the implementation of CR in 2003-2004, almost all diagnostic imaging studies performed in the Department of Radiology became available for electronic distribution. In June 2004, with resources provided by the Hospital Information Technology Department, over 250 personal computers throughout the hospital were enabled to receive diagnostic images using a web-based image display application (Stentor iSite) provided by the Department of Radiology. Access privileges and passwords were created for over 500 physicians. As a result of this project, clinicians in the Emergency Department, on hospital wards, in critical care areas, and in offices are now provided instant access to the radiographic, CT, MRI, and ultrasound images on their patients. Implementation of enterprise distribution has reduced demand for printed film and improved efficiency by providing ready access to image information in clinical areas.

Implementation of IDX Imagecast RIS
The Radiology Information System (RIS) is a critical application central to departmental scheduling, patient registration, reporting, and billing. For many years the department has used an internally-developed RIS. In 2002-2003 the Department selected IDX Imagecast as a replacement for our existing RIS. Much of 2003-2004 was spent in preparation for implementation of the new RIS on September 21, 2004. Activities have included a detailed workflow evaluation, creation of new data dictionaries, preparation of data for conversion, interface programming, and user training. When implemented in late September 2004, the new RIS will provide a high level of integration with Last Word, Speech Recognition, and eventually a new PACS application. The implementation of the RIS will be a critical first step in the elimination of paperwork and improving efficiency for clerical personnel, technologists, and physicians.

Also in 2003-2004, a document scanning module for the RIS was evaluated and purchased. This will become operational shortly after the new RIS is functional in September 2004. Document scanning will have a significant impact on workflow by eliminating the transfer of much paperwork handled by clerical, technical, and physician personnel in the department.

Implementation of Speech Recognition
The radiology report is the definitive product of the department and the timely creation, approval, and distribution of imaging reports is a high priority of all radiology departments. Like many departments, our department has traditionally relied on conventional dictation and transcription to generate reports. This is an expensive approach, subject to many delays related to transcription, editing, and signing of reports. In order to reduce the time from dictation to distribution of final approved reports a new dictation system (Dictaphone PowerScribe) using speech recognition has been implemented. This system permits radiologists to edit and sign their reports immediately after dictation. Implementation of SR was begun in December 2003, and by June 30, 2004, over 90% of all radiology reports
were being generated using speech recognition. This has cut reporting turnaround time in half and resulted in a significant reduction in transcription costs.

PACS Replacement
Currently the department relies on a Canon PACS system for digital image management and archiving. This system is no longer supported by the vendor, is unstable, and is inadequate in handling the image loads of our new multidetector CT scanners. In 2003 a process was begun to identify a new PACS vendor. A series of vendor presentations and site visits were performed in late 2003 and throughout the winter and early spring of 2004. As a result of this research, five potential vendors were identified and an RFP for PACS was created. The RFP is unique and is heavily focused on end-user needs rather than technical specifications. This document will be presented to selected vendors on August 10, 2004. It is anticipated that a purchase agreement will be completed by the end of November 2004 with PACS installation in March/April 2005. The completion of the PACS project will be a major activity of the radiology's informatics team in 2004-2005.

In summary, 2003-2004 has been a busy and productive year for the radiology clinical informatics team. We have made progress in several key areas and established an excellent working relationship with the hospital IT team.

EDUCATIONAL PROGRAMS

The educational programs continue to be one of the major strengths of our department. The radiology residency program is nationally recognized as one of the top programs in the country. This is indeed a major accomplishment and a tribute to our faculty who remain committed to a high caliber of teaching in spite of faculty shortages and increased clinical workload.

RADIOLOGY EDUCATION

Medical Student Program
David Eschelman, MD
Director
Course Directors
401: David Karasick, MD
403: David Friedman, MD
406: Rick Feld, MD
407: David Eschelman, MD
ICM: Terri Tuckman, MD

Diagnostic Radiology Residency Program
Lisa Tartaglino, MD
Director

Nuclear Medicine Residency Program
Charles Intenzo, MD
Director

Fellowship Program and Directors
Catherine Piccoli, MD
Breast Imaging / Women’s Imaging
Joseph Bonn, MD
Cardiovascular/Interventional Radiology
Donald Mitchell, MD
Combined Body MRI/Neuro
Ethan Halpern, MD
Cross-Sectional Imaging/Abdominal Imaging
William Morrison, MD
Musculoskeletal Radiology
Donald Mitchell, MD
MRI (Body)
David Friedman, MD
Neuroradiology
RESIDENCY TRAINING PROGRAM

The goal of our residency program is to produce quality radiologists well trained in all aspects of diagnostic radiology. Upon finishing their training, they will be able to comfortably pursue a career in either an academic or private practice environment. All six of our senior residents passed both the written and the oral portions of the American Board of Radiology Examination. All have been accepted into high quality fellowships of their choice. Four resident graduates have decided to stay with our department to pursue fellowships: two in vascular/interventional, one in combined body/neuro MRI and one in musculoskeletal radiology. One resident graduate is pursuing a fellowship in neuroradiology at Massachusetts General/Harvard Medical School and one is doing a fellowship in pediatric radiology at Children's Hospital of Philadelphia. Our Program Director, Lisa Tartaglino, M.D. has done an outstanding job over the past eighteen months since assuming this position.

Residency Selection: This year we received over 700 applications for seven positions and interviewed approximately 75 candidates. We matched all of our positions from among our top candidates. The teaching and research reputation, as well as availability of cutting edge technology such as multidetector CT, PET scanning and imminent 3T MR, was crucial for recruitment of our top candidates and made us competitive with other top institutions in the country. Thanks to Dr. Levon Nazarian, Chairman of the Residency Selection Committee, for these continued outstanding results.

Resident Research: Resident research is actively encouraged. All residents are expected to complete at least one project by the end of their third year, though many do more. Many of our residents presented papers at national meetings. A few of our residents deserve special mention. Steven Wagner, M.D., who graduated this year and has demonstrated excellent research capabilities throughout his residency, was nominated this year by our department to receive the RSNA Research and Education Foundation Roentgen Resident Research Award, which was presented to him at graduation. Candace Howard-Claudio, M.D., Ph.D., was selected as one of only 15 residents in the country sent to the RSNA for the Bracco Diagnostics “Leaders on the Horizon” program. In addition, Dr. Howard was also selected as one of only ten residents in the country by the International Society for Magnetic Resonance in Medicine (ISMRM) to participate in the prestigious ISMRM/Amersham Health MRI Fellowship program in Kyoto, Japan.

Clinical Training: Residents received extensive clinical training in all areas of diagnostic radiology. Clinical rotations are in compliance with guidelines required by the ACGME and/or recommended by the Association of Program Directors in Radiology (APDR). Almost all training takes place on the Jefferson campus. We have increased the total time residents spend at A.I. duPont Hospital for Children from 2 to 3 months to enhance the educational experience in pediatric radiology. The addition of cutting edge multidetector CT scanners, an on campus PET scanner and continued upgrades to existing MRs and ultrasound units combined with the subspecialty expertise of our faculty, ensures up-to-date experience for our residents and fellows. Academy Imaging provides a brief two-month exposure to the world of private practice with selected faculty while participating in conventional
radiography, mammography and ultrasound.

**TRAINING PROGRAMS FOR FELLOWS**

Our fellowship programs continued to enjoy another year of excellence. There is an increasing number of extremely well qualified applicants in most of the areas offered by our department including: breast imaging, cardiovascular/interventional radiology, body MRI, combined body and neuro MRI, neuroradiology/ENT, US/CT/MRI, and musculoskeletal radiology. All of the above programs received very positive year-end critiques from the graduating fellows.

The **Breast Imaging Fellowship**, under the direction of Cathy Piccoli, M.D., offers training in screening and diagnostic mammography, breast ultrasound, breast MRI, and image guided percutaneous needle localization and biopsy using mammography, ultrasound and MRI. Fellows participate in twice monthly Multidisciplinary Breast Cancer Conference and they are responsible for several resident and medical student conferences. Additionally, participation in a research project is encouraged. During the 2003-2004 academic year, one physician completed 6 months of the Breast Imaging Fellowship.

The **US/CT/MR Cross-sectional Fellowship** has officially been converted into an abdominal imaging fellowship. This fellowship is coordinated by Dr. Ethan Halpern and Dr. Anna Lev-Toaff. Fellows are trained in advanced, multimodality imaging of the abdomen and pelvis, including sonohysterography, virtual colonoscopy and CT/MR urography. There is one month of elective time available for additional training in abdominal imaging or training in extra-

abdominal cross-sectional work. The abdominal imaging program was accredited by the ACGME this year. The program has seven positions and was one of the few abdominal imaging programs that actually filled all of its positions through the match this year.

The **Vascular and Interventional Fellowship**, under the direction of Joseph Bonn, M.D., is an accredited program and remains very popular. All of the positions offered through the NRMP match for 2004 were filled with choice candidates.

The **MRI Fellowship**, under the direction of Donald Mitchell, M.D., remains very popular because of the quality of case volume and faculty, and also because this is one of the most rapidly expanding areas of clinical practice. One position is offered in body/musculoskeletal MRI fellowship and four positions in neuro/body/musculoskeletal MRI fellowship. All of these positions were filled by candidates ranked within the top 10 of the match list from a pool of over one hundred applicants.

The **Musculoskeletal Fellowship** program, under the direction of Adam Zoga, M.D., graduated three strong fellows including Holly C. Gil, who was hired as an Assistant Professor of Radiology at Brown University, Nastaran Fatemi, who accepted a private practice position in Santa Rosa, California, and Joseph B. Furlong, who accepted a private practice position in El Paso, Texas. Both Holly Gil and Nastaran Fatemi presented original scientific papers at the American Roentgen Ray Society meeting in May, and Joe Furlong collaborated with Bill Morrison on a soon to be published book chapter.
Our fellowship positions remain highly coveted as we received more than 40 applications for a single position to be filled through the fellowship match. For the second consecutive year we matched our top choice for this position. We filled our remaining positions prior to the match with Jefferson resident Imran Omar, and with externally funded candidates from Ohio and Pennsylvania.

The Neuroradiology/ENT Radiology Fellowship, under the direction of David Friedman, M.D., filled its three positions for 2004-2005 through the NRMP match; nationwide, only 51% of programs filled all of their positions. The division has expanded the training provided to fellows in advanced CT and MR imaging and reconstruction techniques, and will introduce training in 3 Tesla MR imaging in the near future.

Our visiting fellowships remain very popular in the various subspecialty areas; these programs allow practicing radiologists to learn new techniques and sharpen their traditional skills. Because of our international reputation, several physicians from overseas have chosen to pursue their research theses in our department in the divisions of MRI, Neuroradiology/ENT, Ultrasound, etc.

The junior and senior students can choose to attend one or more of the four separate electives offered by our department, which include general radiology, neuroradiology/ENT radiology, CVIR, and ultrasound/CT/MRI. The radiology electives remain quite popular and were completed by 171 members (73%) of the senior class, either here or at an outside institution. Our radiology elective courses are also popular with medical students from other institutions, with 4 students in attendance this year.

The neuroradiology elective was completed by 15 senior medical students. Electives in cross-sectional imaging and CVIR were completed by 6 and 7 students respectively. All of these courses received rave reviews from the students. I wish to thank all the course coordinators for a fine job – David Karasick, M.D. for general radiology, David Friedman, M.D. for neuroradiology, Rick Feld, M.D. for cross-sectional imaging and David Eschelman, M.D. for CVIR.

CONTINUING MEDICAL EDUCATION PROGRAMS

In spite of all the added pressures of increasing clinical responsibilities, our faculty devote an enormous amount of energy and time to educational activities.

Division of General Radiology: A variety of courses were offered by the division of general radiology, which were all well received. The Jefferson Spine Imaging Symposium, directed by Diane Bergin, M.D. and Jean Yi, M.D. was held in October 2003 with 90 attendees; the Jefferson Upper Extremity Advanced Imaging Symposium was directed by J. Antoni Parellada, M.D. in February 2004 with 100 attendees; as well as the Jefferson Lower Extremity Advanced Imaging Symposium directed by Adam
Zoga, MD. in June 2004 with 75 attendees.

**17th Annual Philip J. Hodes Lecture:**
In honor of Philip J. Hodes, M.D., the Seventeenth Annual Philip J. Hodes lecture was very successful. The guest speaker was N. Reed Dunnick, M.D., Fred Jenner Hodges Professor and Chair, University of Michigan Health System. He gave an outstanding presentation titled “Academic Radiology: Evolution or Extinction”.

**Radiology Grand Rounds:** Grand Rounds in Radiology were held monthly and included 8 topics of interest covering all radiology subspecialties.

**Radiology Research Conferences:** The monthly Radiology Research Conferences were continued this year under the direction of Barry B. Goldberg, M.D. This conference allows the faculty, residents, and fellows in the department the opportunity to present the results of their research activities.

**Jefferson Ultrasound Research and Education Institute (JUREI):** The Jefferson Ultrasound Research and Education Institute, under the leadership of Barry B. Goldberg, M.D., continued its educational programs with more than 40 courses offered in all aspects of ultrasound. The annual Leading Edge meeting, which was held at the Borgata Hotel, Casino and Spa was a success with attendance of greater than 1,200 people. The program was supported by a wide variety of exhibitors and there were lecturers from this country and abroad providing symposia on Ob/Gyn, vascular ultrasound imaging, ultrasound physics, sonomammography, and a symposium on ultrasound contrast agents.

Educational activities of the division will continue in the coming year to support the training of medical students, residents, and fellows under the leadership of various members of the staff including Ethan Halpern, M.D. A series of conferences in all aspects of ultrasound have been arranged for fellows and residents similar to the past year. Our programs for physicians and paramedical personnel, as well as scientists from around the world continue. Efforts are being made to reduce costs and to expand income.

A grant, "Teaching the Teachers" initiative for Latin America, has been awarded by the RSNA Research and Education Foundation. Over the next 3 years this grant will provide funding for the training of radiologists from the Caribbean, Central and South America at JUREI. Upon completion of the program these radiologists will return to their native countries to establish affiliated ultrasound education centers supported by educational materials and donated ultrasound equipment.

We are also in the process of significantly reducing printing costs by providing education materials on CD-ROM and by reorganizing how we advertise our programs.

**RESEARCH ACCOMPLISHMENTS**

During the past year, there have been two major research highlights: establishment of the Jefferson Molecular and Biomedical Imaging Core Facility and the MR physics program, both created with strong support from Dean Thomas Nasca. The imaging facility was established with the acquisition of a small animal PET and CT imaging system, the first state-of-the-art animal molecular imaging equipment on campus. PET-CT fusion imaging is the only combined
imaging modality that allows researchers to accurately investigate disease processes in vivo at the molecular level while also attaining detailed anatomical information in one fused image. This system will allow researchers at TJU to non-invasively image animal models of neurological diseases, cardiac disorders, malignant and benign tumors, and other frequently occurring medical conditions. The lab is supported by expert faculty who are dedicated to providing scientific and technical assistance for imaging experiments, as well as enhancing the capabilities of these technologies to obtain information that will address the research questions of TJU investigators. This PET-CT facility will bring Jefferson to the forefront of the burgeoning molecular imaging field and provide our researchers with the equipment and support to enhance current investigations and lead the way for new discoveries. It is hoped that the improved research capabilities will allow the information obtained from the animal studies to be used in the diagnosis and clinical care of patients sooner than previously achievable.

The MR physics program, under the leadership of Song Lai, Ph.D., was begun in September 2003. Dr. Lai has brought with him a team of computer programmers and post-doctoral fellows to support the much-needed MRI research program. The overall goal of the program is to investigate novel MR imaging techniques aimed at achieving a better understanding of normal and diseased human brain characteristics and function, and thereby improving patient care. The imaging procedures that will eventually be developed through this program are cutting-edge techniques that will provide a new, non-invasive approach to evaluate normal and diseased brain characteristics and functioning. In turn, this is expected to help improve the treatment of brain diseases in the future. The new MRI program will improve research within the department, providing us the ability to significantly improve the level of extramural funding in the department. Additionally, the MRI program will allow collaborative research between radiology and other departments in the university. In the past year, Dr. Lai and his group have initiated projects for 1) MR pulse sequence optimization, 2) the study of hemodynamic response delay relative to brain activation, 3) the study of brain functional connectivity, 4) fMRI image processing software development, 5) development of algorithms for automatic measurement of arterial input function, 6) fMRI study of brain tumor patients, and 7) assessment of MR relaxation rates of novel dendrimer/gadolinium-PNA-ST probes.

Overall, the department's research productivity remained strong despite faculty being challenged by less academic time and increased workload. There were 27 NIH or other federal grants active during the year, in addition to 6 foundation or medical society grants, and another 22 industrial grants. As a group, these grants brought in total current year funding of $3,314,275, including $2,730,121 in direct support and $584,154 in indirect. These totals are more than double last year's funding. We had 181 publications in the medical literature (including journal articles, books and book chapters, and published abstracts) compared with 234 the previous year, demonstrating the impact of increased workload and less academic time.
Our division of **diagnostic ultrasound**, under the leadership of Dr. Barry Goldberg, continued its exceptional research productivity. A variety of basic science, animal, and clinical research were underway for the development and evaluation of ultrasound contrast agents. Dr. Halpern continued his studies examining improved diagnostic evaluation of prostate disease, completing patient enrollment on his DOD-funded study of prostate cancer detection using contrast-enhanced ultrasound in patients. Dr. Goldberg led animal experiments to evaluate ultrasound contrast agents for imaging of lymphatic channels and sentinel lymph nodes, and the pilot data led to an NIH grant submission. Dr. Forsberg continued his outstanding research in conjunction with Drexel University on tissue characterization, as well as evaluating a newly developed ultrasound instrument to measure blood flow volume non-invasively. He also began work on his NIH grant evaluating techniques for detection of angiogenesis.

Dr. Liu also obtained NIH funding, and began studying contrast ultrasound guided radiofrequency ablation of prostate cancer in a dog model. Another area in which there is extensive ongoing research is the use of elastography (which measures the hardness of tissue) to diagnose abnormalities. Dr. Merritt continued animal and human studies of elastography for his NIH project. Dr. Halpern examined prostate cancer diagnosis, Dr. Feld evaluated thyroid nodules, and Dr. Nazarian looked at musculoskeletal injuries.
In breast imaging, Dr. Piccoli continues her efforts on NCI funded cooperative group clinical trials to define the most effective modalities for breast cancer screening. She completed enrollment on a study to evaluate digital versus plain film mammography, as well as a study to examine the efficacy of contralateral breast MRI in women recently diagnosed with breast cancer. Dr. Piccoli also began a trial of the utilization of screening breast ultrasound in a high risk population and has received funding from the Breast Health Institute to help support the infrastructure needed for a clinical breast cancer research program. Additionally, Dr. Piccoli worked on some collaborative projects with Drexel physicists, Dr. Ronald Myers in the Department of Medicine, Dr. Tim Murphy at Geisinger Medical Center, and Dr. Marilyn Tseng at Fox Chase Cancer Center.

In nuclear medicine, Dr. Thakur completed his work supported by an NIH/STTR grant on the imaging of deep vein thrombosis and pulmonary embolism. He continued his work as a co-principal investigator on a DOE-supported project on tumor imaging using gene expression (not listed among our grants because the PI is from another department). Also, his research laboratory is experimenting with 99mTc PNA for both breast and pancreatic cancer and PET imaging with a Cu-64-VIP analog, which may eventually minimize the need for invasive diagnostic procedures and contribute to the management of patients with breast cancer. Dr. Intenzo published a landmark article evaluating long-term clinical outcomes of patients with thyroid stunning, in which he demonstrated that although stunning does exist, it does not lower the therapeutic dose of efficacy, and subsequently there is no impact on patient survival. As a result, clinical practice will be drastically impacted.

In body MRI, Dr. Mitchell was continued his efforts on his NIH grant to study the use of MR to evaluate patients with Hepatitis C. With patient recruitment for the NCI funded cooperative group multicenter study of MR staging of cervical cancer completed, Dr. Mitchell is one of the principal investigators conducting analysis of this trial. In neuroradiology/head and neck radiology, Dr. Flanders began work on a multicenter trial comparing CT perfusion and MR perfusion in predicting stroke outcomes. Additionally, studies were conducted on regional brain activation associated with different performance patterns during learning of a complex motor skill and the value of dynamic contrast-enhanced MR in predicting the histology of parapharyngeal masses.

In body CT, Dr. Needleman began recruitment for two multicenter trials comparing Visipaque-enhanced CT angiography to conventional digital subtraction angiography for peripheral and abdominal imaging. With the second prototype CT installed, Drs. Halpern and Levin have been investigating coronary CT angiography to diagnose coronary disease and for surgical planning.

Our musculoskeletal group continued to publish extensively. Dr. Morrison deserves special recognition for publishing 14 papers in literature, 8 book chapters, and 16 abstracts. Dr. Zoga continued his work on the NCI funded cooperative group study using radio-frequency ablation on bone metastases. Investigation into the use of a new weight-bearing device to evaluate static and dynamic images of lower extremity joints has provided important clinical information to better understand and
more accurately diagnose musculoskeletal abnormalities.

Our health services research group (Dr. Levin, Dr. Parker, Andrea Maitino and I) continued to be highly productive in studying practice patterns and utilization trends in diagnostic imaging and interventions. During the past year, we formalized the group as the Center for Research on Utilization of Imaging Services (CRUISE) and were able to collect enough pilot data to be considered for funding, including support personnel to work on unfunded pilot clinical trials.

Although the department has been productive in clinical research, the research efforts are limited by the amount of time that can be committed. The clinical workload has been increasing, eroding the academic time to carry out research. More financial support is required to increase the number of faculty members, thereby restoring time to perform research.

Additionally, with shrinking federal research funding, an important opportunity to obtain research dollars is through industry sponsored clinical trials. There is a shortage of trained clinician-researchers who are able to carry out this research. In this competitive marketplace, we must be able to compete with other institutions to attract these specially trained clinicians.

RESEARCH WEAKNESSES

Although we have taken some great strides in research with the establishment of the Jefferson Molecular and Biomedical Imaging Core Facility and the MR physics program, proper research infrastructure (funds and personnel) is necessary to be successful in research today. Well-publicized governmental budgetary restraints have made obtaining federal support increasingly difficult, with the majority of projects requiring two resubmissions to be awarded funding. To strengthen the proposal, there needs to be financial support to allow investigators to collect enough pilot data to be considered for funding, including support personnel to work on unfunded pilot clinical trials.

OPPORTUNITIES FOR EXTRAMURAL FUNDING

The 16 grant proposals currently pending are listed in Table 2 of the appendix. There are 9 pending proposals for federal grants and/or subcontracts and 7 proposals to foundations, medical organizations, or industry. The proposals cover a broad spectrum of radiology research. There are also several pending projects outside the department in which our faculty are listed as co-investigators. These are not listed in Table 2 as the principal investigators are faculty members from other TJU departments.

The American College of Radiology Imaging Network (ACRIN), an NCI funded cooperative group, remains a good source of extramural funding for the department. The department has been involved in five projects since the
cooperative group's inception. There are additional projects, which are under development at ACRIN, which we hope to participate in. Additionally, many radiology foundations such as the Society of Interventional Radiology Foundation and Radiological Society of North America Research & Education Foundation provide seed grants to gather pilot data for larger grant submissions.

The addition of the state-of-the-art multislice CTs have been an added resource for obtaining industrial research support, which is expected to continue. Pilot projects funded by Philips Medical Systems have been initiated in cardiac CT and the data will be used to apply for larger federally funded projects. The acquisition of the 3T magnet will provide fruitful endeavors in cardiac, musculoskeletal, and neurologic imaging. Our R&D collaboration with Philips Medical Systems has been beneficial to departmental research.

**AFFILIATIONS AND INTERDEPARTMENTAL ACTIVITIES**

Virtually every clinical department utilizes imaging for clinical care of patients as well as research. Joint endeavors between departments build on the strengths of both the departments to produce mutually beneficial programs.

Our physicians in CVIR and interventional ultrasound are working closely with several oncologists to investigate the use of hepatic chemoembolization, immunoembolization, and radiofrequency ablation in patients with primary and metastatic liver cancer. In breast imaging, radiologists have collaborations with researchers at Geisinger Medical Center, Fox Chase Cancer Center, and Drexel University to examine different aspects of breast disease and diagnosis. In musculoskeletal radiology, we are working closely with the Department of Orthopedic Surgery on projects including the shoulder, hip, foot, and spine imaging. Neuroradiologists continue to collaborate with researchers in the Departments of Neurosurgery, Orthopedic Surgery, and Neurology. In body MR, radiologists work extensively with the hepatology and transplant groups in the Department of Medicine, and continue to collaborate with the MR group at Mt. Sinai Hospital in New York to evaluate high risk individuals for atherosclerotic plaques. The Division of Ultrasound continues to collaborate with investigators from the Department of Pathology in translational research. Dr. Halpern continues his joint effort with the Department of Urology and the Jefferson Prostate Center, while Dr. Nazarian's progress with Dr. McShane from Family Medicine continues to receive wide publicity. Dr. Lev-Toaff continues her efforts in perinatology in the area of high risk pregnancy and Gastroenterology, relative to endoscopic ultrasound. Body CT has been working with members of the Departments of Medicine and Surgery on the use of coronary CT and the division of GI for virtual CT colonography. In nuclear medicine, close collaboration for both diagnostic and treatment procedures have been ongoing with the Departments of Neurology, Endocrinology, Surgery, and Oncology. Additionally, we continue to increase efforts in cooperation with engineering departments at both Drexel University and the University of Delaware.

**DEPARTMENT ADMINISTRATION**

Last year, I pointed out the need to beef up the administrative infrastructure of our department given the size and complexity of our operation. I am pleased to report that with the cooperation of TJUH, we were able to reorganize the
administrative structure and add senior level administrative help. Richard Blob has now assumed the role of associate administrator for clinical operations. He has the primary responsibility for day-to-day clinical operations along with decision-making authority. Richard is a highly dedicated individual with an outstanding work ethic. In addition, Pete Natale has assumed the role of administrative manager for informatics. He also continues to maintain his responsibilities as the chief technologist for MRI and CT imaging. Pete is a highly productive and energetic individual who has demonstrated a strong commitment to the department. Christine Slovak has assumed additional responsibility for the clinical operations at Breast Imaging Center and has done an excellent job. This administrative reorganization has allowed Victor Sarro to devote a little more time and energy to the overall planning and design of the department, expansion initiatives, program development and the physicians practice plan. We are very fortunate to have a strong administrative team lead by Victor Sarro.

As we continue to march forward to adopt new advancements in technology, we also have to prepare to meet the challenges of providing appropriate training to a huge cadre of personnel in the department and keeping them motivated to learn new skills. I am confident the new administrative team is up to the challenge and excited about the developments in progress.

**DEPARTMENT GOALS**

**Retain and recruit faculty** – For the Department of Radiology to continue to succeed in its clinical, research, and academic endeavors, we must retain the motivated and dedicated faculty who have held to build this department, as well as recruit enthusiastic young faculty who will uphold its success in the future. This is a very challenging goal for an academic radiology department with the current shortage of radiologists and the competitive salaries offered by private practice, as well as at some other academic centers. As an academic department, we must provide high quality radiologic services to the Jefferson community while we also strive to advance our field through research and/or educational activities. With the continued budgetary constraints that the institution faces, faculty members are expected to increase their clinical productivity and accept less time to pursue their research and educational goals. In the upcoming year, we need to continue to retain our currently faculty and recruit new faculty with academic potential. This will require providing competitive compensation, as well as adequate time and infrastructure for the faculty to pursue their academic endeavors.

**To become a digital department** – As detailed in the clinical informatics report, the Department of Radiology made significant progress in its transition to a fully digital operation during the past year, but there are several projects that must be completed to accomplish this goal. A digital radiology department will allow electronic order entry, computerized scheduling, interpretation of images on soft copy workstations, reporting by voice recognition, and electronic report and image distribution to referring physicians, and thereby facilitate efficient service to referring physicians and patients, while increasing the productivity of our staff. This is one of the major goals of the department and we anticipate completion within the next two years. The operating rooms and mammography division continue to utilize film for primary image acquisition. Conversion of these two areas to computed radiography in 2004-
2005 would make us a completely filmless department. The new RIS will be implemented in late September 2004, providing a high level of integration with Last Word, Speech Recognition, and eventually a new PACS application. It is anticipated that a new PACS will be selected and installed by April 2005. A digital radiology department will improve departmental efficiency and productivity, reduce expenses, and increase the availability of diagnostic images for clinicians.

Expand the clinical practice – Last year was a very strong year in the clinical practice. We must explore new business opportunities and become involved in mutually advantageous joint ventures to maintain our success. With the plans to acquire a 3T MR unit, and a new 1.5T magnet coming to fruition, we have the opportunity in the upcoming year to offer cutting edge clinical services on state-of-the-art equipment. We must develop and promote advanced MR and CT imaging applications, including a 3D image post-processing laboratory. Current advances in oncologic, cardiac, and neurological imaging will provide us with such an opportunity. Additionally, we plan to implement new programs in women’s imaging, sports medicine, and interventional radiology.

Strengthen departmental infrastructure – As an academic service department, we are expected to provide 24 hour a day expertise of various imaging subspecialties to the entire Jefferson community, while continuing to pursue research and academic endeavors. With the continued budgetary constraints that the institution faces, support staff for faculty has been downsized drastically. Therefore, faculty members must now assume various clinical and administrative tasks, which adversely impacts their clinical, research, and educational productivity. Departmental infrastructure needs to be restored to its previous level to decrease the “busy work” that is overburdening the physicians and increase their efficiency on all three fronts.

Preserve excellence of training programs – As a nationally recognized training program, our radiology educational programs continue to recruit the highest caliber residents and fellows. The high quality of services we provide to the Jefferson community is directly related to the caliber of our trainees. We therefore must continue to provide high quality educational programs to medical students, residents, fellows, and visiting physicians to enable us to continue to attract the best trainees. This goal is dependent upon our ability to retain and recruit dedicated faculty and to provide that faculty the time for educational activities. The future of the field of radiology depends on the quality of training we provide to our residents and fellows and therefore, maintaining the educational program will remain a goal of the department.

Enhance research programs – Over the past year, two significant research goals were achieved with the establishment of the MR physics program and the Jefferson Molecular and Biomedical Imaging Core Facility. The two projects are a first step towards the development and enhancement of imaging research at Jefferson. They are central to the efforts across the campus to enhance the research reputation of Jefferson and increase the research productivity of the medical school. The new programs have the ability to improve research within the department, allow collaborative research between radiology and other departments in the university, and significantly increase our ability to improve the level of extramural funding in the department.
and university as a whole. We must make it a priority to promote these new projects.

**ISSUES FOR THE COLLEGE, UNIVERSITY AND HOSPITAL**

It is encouraging to note several of the issues in this column mentioned in last year's report have been satisfactorily addressed. However, some unfavorable developments in the area of cardiac nuclear imaging occurred, adversely affecting the morale of the faculty.

**Joint program in nuclear cardiac imaging** – Last year I reported that the department forged an equitable partnership with the Division of Cardiology, and established an outpatient imaging facility for nuclear cardiac imaging at the Jefferson Heart Institute as a JUP Cardiology/Radiology joint venture. This agreement was developed in good faith to create a seamless and transparent joint service. The new outpatient imaging facility became operational in September 2003. I am very disappointed to report that this agreement was unilaterally abrogated by Cardiology once the economic success became evident. To say that this represents a breach of trust and a direct blow at the core values of the institution is putting it mildly. Our institutional leadership needs to assure that this kind of behavior is not tolerated.

Despite the past problems, I am willing to again try to develop a collaborative relationship with the Division of Cardiology in cardiac imaging. There are some very important developments in cardiac imaging that may well revolutionize cardiac diagnosis. These include CT angiography of the coronary arteries, cardiac MRI, cardiac PET, and CT coronary calcium scoring. I am willing for Radiology to join Cardiology in a collaborative agreement to provide these services to Jefferson patients. Such an agreement should also include the cardiac nuclear imaging plan that was referred to above. It is essential that JUP develop and promote collaborative ventures like this in a way that is fair to both departments, while at the same time providing synergy to advance the research mission of the institution.

**Joint program in peripheral endovascular procedures** – At the request of the hospital and the Department of Surgery, a joint service between radiology and vascular surgery was created for performing peripheral percutaneous interventions in the CVIR suite. Further, radiologists agreed to train vascular surgeons who had not had the training to prepare them for performing the procedures. Vascular surgery then decided to abrogate this agreement and pursue their own agenda of being independent of radiology. They have asked to perform these procedures in the OR. Soon we may have three groups of physicians, i.e., interventional radiologists, vascular surgeons, and cardiologists competing with each other to provide the same service. Our interventional radiologists have been performing these procedures for years, have a cumulative experience of nearly 60 years, and are widely respected throughout the institution for their clinical skills and quality of care. The experience of vascular surgeons and cardiologists in performing percutaneous peripheral vascular interventions is miniscule in comparison. In an era when patient safety is of paramount concern, an institution like TJUH should be ensuring that patients undergoing these procedures are having them performed only by the physicians who have the best training and the most experience.
TJU and TJUH — There appears to be continuing uneasiness in the relationship between the TJU and the TJUH. Even though these are separate legal entities, there should be far better collaboration and cooperation between the two for strategic planning in areas such as information technologies, risk management, quality of care, faculty recruitment, resulting in improved efficiencies and economies of scale. I am optimistic that our new President will provide leadership in addressing some of these enterprise-wide challenges.

JUP — JUP is making strides to adopt electronic medical record in ambulatory practice, a worthy initiative indeed. Proposed cost allocation methodology is built on the premise that EMR implementation benefits JUP physicians across the board and provides a good beginning for JUP to start thinking as a group practice. Maybe this presents a window of opportunity to address the question on a broader and global scale. A group practice model calls for strategic alliance with shared vision, recruitment of physicians based on needs and opportunities of growth in new areas, with preservation of existing strengths.

As long as departments have to make their budgets, turf wars will continue to be driven by economics. An example is abrogation of the nuclear cardiology agreement by Division of Cardiology.

Endowed Chair — Several of the clinical departments here at Jefferson have an endowed chair or professorship. The Department of Radiology is an exception unfortunately. I feel it is important that we have an endowed chair. Radiology has made huge financial contributions to the University over several years, which have not received recognition. We have thus far paid a far higher dean's tax than any other department amounting to millions of dollars. We had also built up a reserve of over $6 million, which was appropriated by the University. I feel it is justified to request that an endowed chair be established which would lend an appropriate recognition due our department. It is my hope that the Institutional Advancement Office will work closely with us to identify potential donors to create several endowed professorships in the department.
PUBLICATIONS

Journal Articles:


Books and Book Chapters:


**Abstracts:**


121. Goldberg B: Recent advances in ultrasound contrast agents. *Proceedings of the XV1th Congress of the European Federation of Societies for Ultrasound in Medicine and Biology, Zagreb, Croatia, June 2004.*


180. Zoga AC, Morrison WB, Fenlin JM, Ciccotti MG: Low field strength open MR assessment of the rotator cuff with operative correlation: T2 FSE vs STIR assessment of rotator cuff pathology on a 0.3T system. *AJR* 2004; 182(S):58.

OKSANA H. BAL TAROWICH, M.D.

October 27-30, 2003  Ukrainian Congress of Radiologists, Kyiv, Ukraine
    • “Sonography of portal hypertension”
    • “Sonography of TIPS (Transjugular Intrahepatic Portosystemic Shunts)”

November 6, 2003  Department of Radiology, Lviv Regional Diagnostic Center, Lviv, Ukraine
    • “Sonography of portal hypertension”
    • “Sonography of the uterus”

January 12, 2004  Schering Cardiovascular Program, Department of Health Policy, Thomas Jefferson University, Philadelphia, PA
    • “Carotid ultrasound”

January 20, 2004  Greater Delaware Valley Ultrasound Society, Philadelphia, PA
    • “Sonography of TIPS (Transjugular Intrahepatic Portosystemic Shunts)”

March 18, 2004  Department of Radiology Grand Rounds, Harlem Medical Hospitals, New York, NY
    • “How to avoid pitfalls in transvaginal sonography of the pelvis”

May 11-14, 2004  The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
    • “How to avoid pitfalls in transvaginal sonography of the pelvis”

DIANE C. BERG IN, M.D.

October 18-19, 2003  Jefferson Spine Imaging Symposium, Philadelphia, PA
    • “Bone marrow imaging”

November 30-December 5, 2003  89th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
    • “Axial MR imaging of the scapholunate and lunotriquetral ligament. Correlation with arthroscopy”
    • “Intraductal papillary mucinous tumor of the pancreas. Four year follow up by MR” (poster)

February 21-22, 2004  Jefferson Upper Extremity Imaging Symposium, Philadelphia, PA
    • “Elbow MR anatomy and pathology”

JOSEPH BON N, M.D.

October 18, 2003  Southeastern Angiographic Society, Amelia Island, FL
    • “Uterine fibroid embolization: Update and marketing”
    • “Retrievable vena cava filters”
    • “Physician extenders and clinic development”

November 18-21, 2003  11th Annual Advanced Interventional Management Symposium, New York, NY
    • “Embolic agents for UAE: A volume/efficacy analysis”
February 26, 2004  Department of Surgery Grand Rounds, Lancaster General Hospital, Lancaster, PA  
  • “Uterine artery embolization for symptomatic leiomyomata”

April 22, 2004  Department of Surgery Grand Rounds, Riddle Memorial Hospital, Media, PA  
  • “Interventional radiology in the care of the general surgery patient”

May 12, 2004  The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ  
  • “Update on uterine artery embolization for leiomyomata”

W. SCOTT ENOCHS, M.D., PH.D.

  • “Dynamic gadolinium-enhanced MRI: Applications in head and neck imaging”

October 18-19, 2003  Jefferson Spine Imaging Symposium, Philadelphia, PA  
  • “Nomenclature of degenerative spine imaging”

ADAM E. FLANDERS, M.D.

August 10-13, 2003  World Spine II, Chicago, IL  
  • “Imaging of spine & spinal cord injury”

November 30-December 5, 2003  89th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL  
  • “Imaging of spinal trauma and spinal cord injury” (refresher course)  
  • “How your radiology practice can ‘work the web’” (refresher course)  
  • “Introduction to PowerPoint presentations: Basic skills” (refresher course)  
  • “Introduction to PowerPoint presentations: Advanced skills” (refresher course)  
  • “How to get radiologic images into your personal computer” (refresher course)  
  • “Radiology informatics: PACS: Tools II” (co-moderator)  
  • “Radiology informatics: Personal digital assistants” (co-moderator)

February 16-19, 2004  American Society of Spine Radiology 2004 Spine Imaging Symposium, Miami Beach, FL  
  • “MRI of cervical spinal cord injury and clinical correlates”

March 27-April 2, 2004  36th International Diagnostic Course in Davos, Brain, Head, Neck and Spine, Davos, Switzerland  
  • “Spine trauma”

May 20-23, 2004  21st Meeting of the Society of Computer Applications in Radiology, Vancouver, Canada  
  • “PDAs”
FLEMMING FORSBERG, PH.D.

July 1-3, 2003  
Ultrasoundics International 2003, Granada, Spain
- "Assessment of angiogenesis: Implications for ultrasound imaging"
- "Acoustic microscopy system: Design and preliminary results"
- "Ultrasonic biomedical technology: Marketing versus clinical reality"

July 25, 2003  
Advanced Logiq 700 Technology, GE Medical Systems, Milwaukee, WI
- "Advances in ultrasound contrast imaging"

August 22, 2003  
Kimmel Cancer Center Annual Retreat, Bryn Mawr, PA
- "Cancer research and imaging: Ultrasound"

September 25, 2003  
Breakthrough Seminar 2003, GE Yokogawa Medical Systems, Osaka, Japan
- "New methods and applications for ultrasound contrast imaging"

September 27, 2003  
15th Doppler Ultrasound Meeting, Japanese Ultrasound Society, Tokyo, Japan
- "Recent developments in contrast enhanced ultrasound imaging – An American perspective"

October 24, 2003  
Biomedical Ultrasound Faculty Group Seminar, Drexel University, Philadelphia, PA
- "In vivo subharmonic imaging and pressure estimation"

October 29, 2003  
Advanced Logiq 700 Technology, GE Medical Systems, Milwaukee, WI
- "Advances in ultrasound contrast imaging"

November 10, 2003  
Jefferson Oncology Group Annual Meeting, Jefferson Cancer Network, Philadelphia, PA
- "Cancer research and ultrasound imaging"

November 30- December 5, 2003  
89th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- "Principles of Doppler imaging"
- "The duration of in vivo US enhancement increases with the hydrophobicity of polymer encapsulated microbubbles"

January 23-24, 2004  
Giornate Fiorentine di Angiologia, Florence, Italy
- "New methods and applications for ultrasound contrast imaging"
- "Recent advances in 3D vascular imaging techniques"

February 4, 2004  
Advanced Logiq 700 Technology, GE Medical Systems, Milwaukee, WI
- "New developments in ultrasound contrast imaging"
- "Advances in vascular 3D ultrasound imaging"

May 11-14, 2004  
The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
- "In vivo subharmonic imaging and perfusion estimation"
- "Contrast imaging modalities: Harmonics, power Doppler, triggering...which should I use?"
May 19-21, 2004
Twenty-ninth International Symposium on Ultrasonic Imaging and Tissue Characterization, Washington DC
• “In vitro and in vivo volume flow measurements with a semi-automated 4-D Doppler ultrasound unit”

June 20-22, 2004
The 48th Annual Convention of the American Institute of Ultrasound in Medicine, Phoenix, AZ
• “Microvessel density and contrast enhanced TRUS for prostate cancer diagnosis”
• “Measurement of volume flow and peak systolic velocity with a semi-automated 4-D Doppler ultrasound device: initial experience”
• “Design and acoustic characterization of a nano-scale ultrasound contrast agent”
• “In vivo pressure estimation using subharmonic contrast microbubble signals: Proof of concept”

DAVID P. FRIEDMAN, M.D.

October 18-19, 2003
Jefferson Spine Imaging Symposium, Philadelphia, PA
• “Arachnoiditis”

BARRY B. GOLDBERG, M.D.

October 17-19, 2003
Society of Radiologists in Ultrasound 13th Annual Meeting, Chicago, IL
• “A unique approach to ultrasound education and equipment donation in developing countries”

November 30 - December 5, 2003
89th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
• “International emergency radiology symposium” (moderator)
• “International panel: Beginning an academic career” (panel member)
• “Demonstration of a new, advanced ultrasound research interface (URI) which can greatly enhance research in clinical ultrasound” (poster)
• “Contrast-enhanced ultrasound imaging of lymphatic channels and sentinel lymph nodes: Preliminary experiences”

February 1-2, 2004
Think Tank in Molecular Imaging of Prostate Cancer, sponsored by the Prostate Cancer Foundation, Washington, DC
• “Ultrasound”

February 14-17, 2004
20th Annual Masters Radiology Conference and Hawaii Radiological Society’s Annual Outer Island Meeting, Maui, Hawaii
• “Advances in 3-D ultrasound imaging” (Felson Memorial Lecture)
• “Sonomammography”
• “Neurosonography”
• “Advances in Doppler imaging”
• “Invasive and interventional ultrasound”

March 11-16, 2004
Advanced Ultrasound Symposium, Chinese Ultrasound Society, Hangzhou, China
• “Advances in ultrasound imaging”
• “International ultrasound education and certification”
April 22-23, 2004  
American Institute of Ultrasound in Medicine Compact/Hand-Held Ultrasound Forum, Pentagon City, VA
- "Ultrasound use worldwide"

May 11-14, 2004  
The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
- "Ultrasound contrast agents in abdominal vascular imaging"
- "The use of ultrasound contrast in the breast"
- "Microbubble-enhanced liver studies"

June 5-8, 2004  
XVI European Congress of Ultrasound in Medicine and Biology, Zagreb, Croatia
- "Thomas Jefferson University - Recent advances in ultrasound" (chair)
- "General abdomen ultrasound" (chair)
- "Recent advances in ultrasound contrast agents"
- "The past, present and future of ultrasound"

June 20-22, 2004  
The 48th Annual Convention of the American Institute of Ultrasound in Medicine, Phoenix, AZ
- "Future directions in three-dimensional imaging" (Kenneth J. W. Taylor, M.D. Memorial Lecture)
- "Lymphatic update of US contrast microbubbles"

June 25-29, 2004  
23rd International Congress of Radiology, Montreal, Canada
- "A comprehensive approach to ultrasound education in emerging countries" (Fuchs Lecture)

**ETHAN J. HALPERN, M.D.**

November 30-December 5, 2003  
89th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- "Adjusted likelihood ratio for a diagnostic test in the presence of confounding"
- "Comparison of contrast-enhanced targeted biopsy of the prostate to modified sextant biopsy"
- "Contrast enhanced imaging of the prostate for cancer detection"

October 26-29, 2003  
American Urological Association Mid-Atlantic Section Annual Meeting, Boca Raton, FL
- "Comparison of contrast-enhanced targeted biopsy of the prostate to modified sextant biopsy"

**CHARLES M. INTENZO, M.D.**

November 30-December 5, 2003  
89th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- "Silent thyroiditis in recovery: The great mimicker of Graves' disease"
- "The post-ablation I-131 total body scan in stage I and II well-differentiated thyroid cancer: Does it impact patient management?"
- "The relative roles of radiologists and nonradiologists in dual-energy x-ray absorptiometry: Comparison between 1998 and 2001 using a nationwide Medicare database"
• "Repeat I-131 therapy in Graves' disease: What is the optimal approach?"
• "Scintigraphic manifestations of subclinical hyperthyroidism: A 5-year analysis"

DAVID KARASICK, M.D.

September 20, 2003  International Skeletal Society, San Francisco, CA
• "Imaging of the rheumatoid spine"

October 18-19, 2003 Jefferson Spine Imaging Symposium, Philadelphia, PA
• "Spine tumors"

November 10-11, 2003 Department of Radiology Grand Rounds, Massachusetts General and Brigham & Women's Hospital, Boston, MA
• "Imaging of spine fusion complications"

February 21-22, 2004 Jefferson Upper Extremity Imaging Symposium, Philadelphia, PA
• "Conventional radiography of the traumatized shoulder"
• "Conventional radiography of the traumatized elbow and wrist"

May 2-7, 2004 American Roentgen Ray Society 104th Annual Meeting, Miami, FL
• "Knee" (moderator)

June 26-27, 2004 Jefferson Lower Extremity Symposium, Philadelphia, PA
• "Imaging characteristics of bone tumors"
• "Arthropathies 'heel to toe'"

STEPHEN KARASICK, M.D.

September 22, 2003  Novartis Center of Excellence Program, Novartis Pharmaceuticals, Philadelphia, PA
• "Introduction to IBS"

November 18, 2003 Novartis Center of Excellence Program, Novartis Pharmaceuticals, Philadelphia, PA
• "Introduction to IBS"

December 8, 2003 Novartis Center of Excellence Program, Novartis Pharmaceuticals, Philadelphia, PA
• "Introduction to IBS"

May 2-7, 2004 American Roentgen Ray Society 104th Annual Meeting, Miami, FL
• "CT urography and kidneys" (moderator)

May 10, 2004 Novartis Center of Excellence Program, Novartis Pharmaceuticals, Philadelphia, PA
• "Introduction to IBS"
SUNG M. KIM, M.D.

November 30-December 5, 2003
89th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- "Brain perfusion SPECT evaluation of central subjective tinnitus" (poster)

June 19-23, 2004
51st Annual Meeting of the Society of Nuclear Medicine, Philadelphia, PA
- "Intense myocardial uptake on fasting whole-body FDG-PET indicates the presence of cardiac disease"
- "Can salivary gland uptake on a diagnostic I-131 scan predict acute salivary gland dysfunction in patients receiving radio-iodine therapy for thyroid cancer?" (poster)
- "Semiquantitative analysis of liver metabolic activity on 18f-FDG PET" (poster)

ALFRED B. KURTZ, M.D.

October 4-5, 2003
Imaging Perspective IX: Advances in Clinical Sonography, sponsored by the Houston Radiological Society, Houston, TX
- "How to evaluate fetal age and growth"
- "Sonography of the fetal neural axis"
- "Sonography of the fetal GI tract"
- "Detection of ovarian cancer with CT-MR correlation"
- "Ultrasound and Doppler evaluation of ectopic pregnancy"

October 31-November 2, 2003
5th Annual: National Conference on Ob-Gyn Ultrasound, Chicago, IL
- "Ultrasound in the 1st trimester"
- "Standards in OB ultrasonography"
- "Current and future trends in ultrasound: The perspectives of a former AIUM president"
- "Ultrasound and Doppler of ectopic pregnancies"
- "It’s 3am! Emergencies in the 2nd and 3rd trimester"

January 6, 2004
Department of Radiology, Bryn Mawr Hospital, Bryn Mawr, PA
- Case presentation (visiting professor)

May 11-14, 2004
The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
- "Advances in Ob/Gyn" (co-director and moderator)

June 20-22, 2004
The 48th Annual Convention of the American Institute of Ultrasound in Medicine, Phoenix, AZ
- "Sonohysterographic findings in the uterine cavity: Surgical/pathological correlation"

SONG LAI, PH.D.

November 8-9, 2003
Annual Meeting of the Chinese Society of Radiology, Guangzhou, China
- "Clinical applications of fMRI"
March 21-23, 2004
International Society for Magnetic Resonance in Medicine Workshop on Quantitative Cerebral Perfusion Imaging Using MRI: A Technical Perspective, Venice, Italy
- “Automatic arterial input function for DSC perfusion MRI” (poster)

May 15-21, 2004
International Society for Magnetic Resonance in Medicine 12th Scientific Meeting and Exhibition, Kyoto, Japan
- “Combined DTI and functional connectivity assessment of cerebral neoplasia” (poster)
- “Maximized mutual information: A novel approach for brain activation detection in fMRI” (poster)
- “Sequential cross correlation: A robust technique to detect brain activation in fMRI” (poster)
- “Automatic arterial input function for perfusion MRI” (poster)

May 22-23, 2004
International Society for Magnetic Resonance in Medicine Workshop: “MR State-of-the-Art”, Shanghai, China
- “Applications of perfusion MRI and susceptibility-weighted MRI”

ANNA S. LEV-TOAFF, M.D.

March 5-7, 2004
Southwest Ob/Gyn Ultrasound Symposium, Phoenix, AZ
- “Sonohysterography: How I do it?”
- “Three dimensional ultrasound in gynecology”
- “Understanding uterine malformations”

March 7-11, 2004
Abdominal Radiology Course 2004, Scottsdale, AZ
- “Hysterosalpingography and hysterosonography”

May 2-7, 2004
American Roentgen Ray Society 104th Annual Meeting, Miami, FL
- “Three-dimensional ultrasound of the female pelvis”

May 11-14, 2004
The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
- “Understanding uterine malformations”
- “Sonohysterography: Uterus and tubes”

June 4-6, 2004
2nd Annual Advances in 3D/4D Ultrasound, Washington, DC
- “Understanding uterine malformations: The role of 3D”
- “3D and sonohysterography”

JI-BIN LIU, M.D.

August 12, 2003
Department of Ultrasound Grand Rounds, Peking Union Medical College Hospital, Beijing, China
- “Ultrasound-guided thermal ablation of liver tumors”
- “Ultrasound diagnosis of bladder tumors”

August 13, 2003
Department of Ultrasound Grand Rounds, First Zhongshan Hospital, Guangzhou, China
- “Ultrasound-guided RF ablation of liver tumors”
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<tr>
<th>Date</th>
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<tr>
<td>August 14, 2003</td>
<td>Department of Ultrasound Grand Rounds, Second Hospital of Guangzhou Medical University, Guangzhou, China</td>
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<td>• &quot;Ultrasound-guided tumor ablation: What should we know&quot;</td>
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<td>August 14, 2003</td>
<td>Department of Ultrasound Grand Rounds, Guangzhou Provincial Hospital, Guangzhou, China</td>
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<td>• &quot;Ultrasound-guided thermal ablation of liver tumors&quot;</td>
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<td>August 15, 2003</td>
<td>Department of Ultrasound Grand Rounds, Guangzhou Traditional Medical Hospital, Guangzhou, China</td>
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<td>• &quot;Review of ultrasound-guided thermal ablation of tumors&quot;</td>
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<td>August 15, 2003</td>
<td>Ultrasound Symposium, Guangzhou Tumor Hospital, Guangzhou, China</td>
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<td>• &quot;Ultrasound-guided RF ablation of liver tumors&quot;</td>
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<td>• &quot;Vascular and non-vascular contrast-enhanced ultrasound imaging&quot;</td>
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<td>• &quot;Sonohysterography&quot;</td>
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<td>• &quot;Endoluminal ultrasound&quot;</td>
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<td>August 18, 2003</td>
<td>Department of Ultrasound Grand Rounds, Xinqiao Hospital, Chongqing, China</td>
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<td>• &quot;Review of ultrasound-guided thermal ablation of tumors&quot;</td>
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<td>August 19, 2003</td>
<td>Second Southwest Ultrasound Conference, Chongqing, China</td>
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<td>• &quot;Ultrasound-guided interventional procedures for tumor ablation&quot;</td>
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<td>August 20, 2003</td>
<td>Department of Ultrasound Grand Rounds, Huaxi Medical University First Hospital, Chengdu, China</td>
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<td>• &quot;New advances in medical ultrasound&quot;</td>
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<td>August 24, 2003</td>
<td>Ultrasound Symposium, Shanghai Ultrasound Society in Medicine and Engineering, Shanghai, China</td>
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<td>• &quot;Ultrasound contrast-enhanced imaging&quot;</td>
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<td>August 25, 2003</td>
<td>Department of Ultrasound Grand Rounds, Second Hospital of Xiamen City, Xiamen, China</td>
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<td>• &quot;Review of ultrasound-guided thermal ablation of tumors&quot;</td>
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<td>August 26, 2003</td>
<td>Department of Ultrasound Grand Rounds, Second Affiliated Hospital of Fuzhou Medical University, Quanzhou, China</td>
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<td>November 30-</td>
<td>89th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL</td>
<td>• &quot;Initial design and testing of a 75 MHz acoustic microscopy system&quot; (poster)</td>
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<td>March 11-16, 2004</td>
<td>Advanced Ultrasound Symposium, Chinese Ultrasound Society, Hangzhou, China</td>
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<td>• &quot;Ultrasound and internet&quot;</td>
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<td>The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ</td>
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<td>• &quot;2D and 3D intravascular ultrasound&quot;</td>
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<td>June 20-22, 2004</td>
<td>The 48th Annual Convention of the American Institute of Ultrasound in Medicine, Phoenix, AZ</td>
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• “Incidence of crossing vessels in patients with normal ureteropelvic junction” (poster)
• “Contrast-enhanced lymphosonography: Preliminary observations” (poster)

CHRISTOPHER R.B. MERRITT, M.D.

October 17-19, 2003 Society of Radiologists in Ultrasound 13th Annual Meeting, Chicago, IL
• “Doppler – Optimizing techniques”

November 30-December 5, 2003 89th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
• “Equipment selection (AAPM tutorial)”

January 24, 2004 Duke Vascular Ultrasound Course, Charlotte, NC
• “Contrast ultrasound – Issues and opportunities”
• “Abdominal venous ultrasound”

May 2-7, 2004 American Roentgen Ray Society 104th Annual Meeting, Miami, FL
• “A word is worth a thousand pictures – Reporting in radiology” (presidential address)

May 11-14, 2004 The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
• “Breast ultrasound physics”
• “Breast ultrasound – Diagnostic criteria”
• “Doppler basics”
• “Screening ultrasound”
• “Intraoperative GYN ultrasound”

DONALD G. MITCHELL, M.D.

July 10-16, 2003 International Society for Magnetic Resonance in Medicine 11th Scientific Meeting and Exhibition, Toronto, Canada
• “Diffuse liver diseases, nodules”

July 14-18, 2003 Summer Body Imaging Conference, sponsored by New York University, Whistler, Canada
• “Body MRI techniques”
• “MRI of focal liver lesions”
• “MRI of cirrhosis and HCC”
• “MRI of the pancreas”
• “Gynecologic MRI”

September 18-21, 2003 Royal Australia New Zealand Congress of Radiology 54th Annual Scientific Meeting, Brisbane, Australia
• “Techniques for body MRI”
• “MRI of the liver”
• “MRCP and pancreatic MRI”
• “MRI of the kidneys and adrenals”
November 30-December 5, 2003  
89th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL  
• "Functional magnetic resonance cholangiography (f-MRC): Diagnosis of functional abnormalities of the gallbladder and biliary tree"  
• "Liver MR: Advanced imaging" (refresher course)

March 10, 2004  
Visiting Professor, Department of Radiology, Mercy Fitzgerald Hospital, Philadelphia, PA  
• "Body MRI board review"

March 22-26, 2004  
Society of Computed Body Tomography and Magnetic Resonance 27th Annual Meeting, Henderson, NV  
• "MRI of diffuse liver disease (advanced)"  
• "MRI of focal liver disease"

April 14, 2004  
Department of Radiology Grand Rounds, New York Presbyterian Hospital, New York, NY  
• "Liver MR"

May 8, 2004  
Current Concepts in Body MRI, ACR Categorical Course, Washington, DC  
• "Body MRI basics"  
• "Liver"

May 15-21, 2004  
International Society for Magnetic Resonance in Medicine 12th Scientific Meeting and Exhibition, Kyoto, Japan  
• "Body MRI techniques"

WILLIAM B. MORRISON, M.D.

July 10-16, 2003  
International Society for Magnetic Resonance in Medicine 11th Scientific Meeting and Exhibition, Toronto, Canada  
• "Accuracy of MR in detection of pedal osteomyelitis in the postoperative patient"  
• "Use of femoral abduction external rotation (FABER) positioning for the diagnosis of acetabular labral tear during MR arthrography"  
• Neutral and stress MR imaging of the ankle using a multidirectional kinematic device: Unreliability of morphologic criteria for diagnosis of lateral ligament insufficiency" (poster)  
• "Evaluation of previously published staging systems of osteochondral lesions of the talus in follow-up MR imaging of non-surgically treated ankles" (poster)

October 14, 2003  
Department of Radiology Grand Rounds, Hospital for Joint Diseases Orthopaedic Institute, New York, NY  
• "Interesting cases"

October 15, 2003  
MRI: Clinical State of the Art, sponsored by New York University Medical Center, New York, NY  
• "The shoulder: Rotator cuff"  
• "Ankle sports injuries"  
• "The diabetic foot"

November 5, 2003  
Sports Medicine Seminar, Doylestown, PA  
• "MRI of the knee"
<table>
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<tr>
<th>Date</th>
<th>Location/Conference Details</th>
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| November 30-December 5, 2003 | 89th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL  
- “Evaluation of the postoperative shoulder”  
- “Imaging of spinal trauma” |
| January 13, 2004  | Armed Forces Institute of Pathology, Washington, DC  
- “MR imaging of the elbow” |
| February 9, 2004  | Department of Radiology Grand Rounds, Hospital for Special Surgery, New York, NY  
- “MRI of pedal infection” |
| February 21-22, 2004 | Jefferson Upper Extremity Imaging Symposium, Philadelphia, PA  
- “Postoperative MR imaging” |
- “MR imaging of the shoulder: Instability”  
- “MR of articular cartilage”  
- “MR of knee ligaments”  
- “MRI of the hip: When should I call a labral tear?” |
| March 7-10, 2004  | 27th Annual Meeting of the Society of Skeletal Radiology, Tucson, AZ  
- “Vertebroplasty: Utilization and provider distribution in the US, 2001-2002” |
| March 16, 2004    | Armed Forces Institute of Pathology, Washington, DC  
- “MR imaging of the elbow” |
- “Imaging of tendons” |
| April 16-18, 2004 | Musculoskeletal Imaging in DC: Emphasis on MRI, Washington, DC  
- “MR arthrography”  
- “MRI of the postoperative shoulder”  
- “MRI of fractures and stress”  
- “MRI of the knee: Menisci”  
- “MRI of the knee: Ligaments and tendons”  
- “MRI of the hip and pelvis”  
- “MRI of cartilage” |
| May 2-7, 2004     | American Roentgen Ray Society 104th Annual Meeting, Miami, FL  
- “Vertebroplasty: Utilization and provider distribution in the US, 2001-2002”  
- “Low field strength open MR assessment of the rotator cuff with operative correlation: T2 FSE vs STIR” |
| May 15-21, 2004   | International Society for Magnetic Resonance in Medicine 12th Scientific Meeting and Exhibition, Kyoto, Japan  
- “Anterior cruciate ligament volume analysis: Gender-related differences”  
- “MRI of shoulder impingement”  
- “Optimization of musculoskeletal MRI protocols” |
• “Novel MR techniques for clinical musculoskeletal imaging” (clinical science focus session)
• “Musculoskeletal imaging” (categorical course)

June 17, 2004
Sports Medicine Seminar, Doylestown, PA
• “MRI of the spine”

LEVON N. NAZARIAN, M.D.

September 17, 2003
Division of Rheumatology Grand Rounds, Department of Medicine, Thomas Jefferson University Hospital, Philadelphia, PA
• “Updates on the use of musculoskeletal ultrasound”

September 20, 2003
Jefferson Hospital Philadelphia Distance Run Health Expo, Philadelphia, PA
• “Ultrasound in the diagnosis and treatment of injuries in runners”

October 11, 2003
Musculoskeletal Ultrasound Society 13th Annual Meeting, Washington, DC
• “Sports interventional procedures”
• “US anatomy and pathology of the foot and ankle”
• Hands-on scanning session (instructor)

October 17-19, 2003
Society of Radiologists in Ultrasound 13th Annual Meeting, Chicago, IL
• “Musculoskeletal ultrason: An update on diagnosis and intervention” (moderator)
• “Ultrasound of foot and ankle: Diagnosis and intervention”
• Hands-on scanning sessions (instructor)

October 21, 2003
Greater Delaware Valley Ultrasound Society, Philadelphia, PA
• “Shoulder ultrasound seminar”

November 30-December 5, 2003
89th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
• “Comparing contrast-enhanced ultrasound to angiogenic markers from melanoma in a murine model”

February 21-22, 2004
Jefferson Upper Extremity Imaging Symposium, Philadelphia, PA
• “Shoulder sonography”

March 20, 2004
Visiting Professor, Illinois Bone and Joint Institute, Morton Grove, IL
• “Shoulder sonography”
• “Sonography of the foot and ankle”

April 18, 2004
2004 Ultrasonic Industry Association Medical Workshop, New York, NY
• “Clinical musculoskeletal ultrasound imaging: State-of-the-art and future challenges”

May 11-14, 2004
The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
• “Angiogenesis evaluated with ultrasound imaging”
LAURENCE NEEDLEMAN, M.D.

October 17-19, 2003  
Society of Radiologists in Ultrasound 13th Annual Meeting, Chicago, IL  
- “Carotid ultrasound: New horizons and techniques”  
- “Controversies in venous ultrasound”  

November 21-22, 2003  
Advances in Vascular Imaging and Diagnosis, 14th Symposium and Workshop on Management and Clinical Issues, sponsored by Montefiore Medical Center, New York, NY  
- “Controversies in venous ultrasound”  
- “Super panel on venous disease”  
- “Doppler waveforms: A reflection of hemodynamics”  

November 30-December 5, 2003  
89th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL  
- “There is high diastolic flow: What does that mean?”  

January 30-31, 2004  
Adriatic Vascular Ultrasound Society – 1st Vascular Ultrasound Annual Meeting, Opatija, Croatia  
- “Carotid and vertebral arteries”  
- “Anatomy of peripheral arteries and veins”  

April 23-25, 2004  
29th Annual Spring Diagnostic Ultrasound Conference, sponsored by the Los Angeles Radiological Society, Los Angeles, CA  
- “New techniques in vascular ultrasound”  
- “Hemodynamics and cardinal features of Doppler diagnosis”  
- “Postcatheterization and groin ultrasound: Differential diagnosis and treatment options for vascular injury”  
- “Lower extremity venous ultrasound”  
- “Renal artery stenosis evaluation: Ultrasound, CT, MR or other?”  

May 11-14, 2004  
The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ  
- Case presentations  

June 5-8, 2004  
XVI European Congress of Ultrasound in Medicine and Biology, Zagreb, Croatia  
- “Advances and controversies in carotid ultrasound diagnosis”  
- “Peripheral veins”  
- “Doppler of renal arteries”  
- “Doppler of peripheral veins”  
- Case report session  

PATRICK L. O’KANE, M.D.

April 26-28, 2004  
Department of Radiology Grand Rounds, University of Arizona, Tucson, AZ  
- “Principles of vascular ultrasound”  

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CATHERINE W. PICCOLI, M.D.

October 29, 2003  Department of Radiology Grand Rounds, West Reading Hospital, West Reading, PA
  • “Breast MRI”

March 17, 2004  Visiting Professor, Department of Radiology, Children’s Hospital of Philadelphia, Philadelphia, PA
  • “Ultrasound of the breast in patients under 25”

March 20, 2004  St. Louis Metro Area Sonographers Society Day Symposium, St. Louis, MO
  • “BIRADS ultrasound lexicon”

April 4, 2004  World Class Ultrasound: Current Concepts in Breast Ultrasound, sponsored by Loma Linda University, Las Vegas, NV
  • “Interventional breast ultrasound”
  • “Sonographic-mammographic correlation”
  • “BI-RADS terminology in breast ultrasound”

May 11-14, 2004  The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
  • “Ultrasound guided interventional procedures of the breast”
  • “Ultrasound evaluation of breast implants”
  • “Ultrasound guided breast biopsy: Hands on”

VIJAY M. RAO, M.D.

  • “Turf battles in radiology – How to fight them and win”
  • “Current nationwide levels of utilization of the various imaging modalities within radiology”
  • “Trends in faculty productivity in academic radiology departments”

November 30-
December 5, 2003  89th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
  • “Comparative changes in payments to radiologists, cardiologists, and other physicians for noninvasive diagnostic imaging (NDI) services during recent years”
  • “Who gets paid for diagnostic imaging and how much?”

January 29, 2004  Department of Radiology Grand Rounds, Bryn Mawr Hospital, Bryn Mawr, PA
  • “Interesting head and neck cases”

February 11, 2004  Department of Radiology Grand Rounds, Mercy Catholic Medical Center, Fitzgerald Mercy Division, Darby, PA
  • “Sinosasal imaging”

March 4, 2004  Philadelphia Roentgen Ray Society, Philadelphia, PA
  • “Advanced imaging of head and neck cancer”

April 21-24, 2004  52nd Annual Meeting of the Association of University Radiologists, San Francisco, CA
  • “How do we evaluate program directors?”
May 19, 2004  
Department of Radiology Grand Rounds, Cooper Medical Center, Camden, NJ  
• “Interesting head and neck cases”

LISA TARTAGLINO, M.D.  

October 18-19, 2003  
Jefferson Spine Imaging Symposium, Philadelphia, PA  
• “Inflammatory intramedullary spinal cord disorders”

MATHEW L. THAKUR, PH.D.  

August 11-14, 2003  
15th International Symposium on Radiopharmaceutical Chemistry, Sydney, Australia  
• “Preparation of Cu-64 and Tc-99m-N$_2$S$_2$ vasoactive intestinal peptide (VIP) for imaging gene expression”  
• “Imaging oncogene mRNA with Tc-99m-PNA-Peptide chimeras”

August 23-27, 2003  
European Association of Nuclear Medicine Annual Congress, Amsterdam, the Netherlands  
• “Tc-99m-vasoactive intestinal peptide: Influence of N$_4$ vs N$_2$S$_2$ chelation”  
• “Imaging r-chain fibrin to image fresh and aged venous thrombosis (VT) and pulmonary embolism (PE) in swine”

August 26-31, 2003  
Annual Meeting of the Brazilian Society of Nuclear Medicine and ALASBIMN, Cancun, Mexico  
• “Imaging infection: Now and the future”  
• “Nuclear medicine and molecular imaging”

September 9, 2003  
Department of Radiology Grand Rounds, University of Pennsylvania, Philadelphia, PA  
• “Radiopharmaceuticals: Pharmacokinetics”

November 7-8, 2003  
Central Chapter of the Society of Nuclear Medicine Annual Meeting, Detroit, MI  
• “Recent advances in imaging infection”

December 16, 2003  
Department of Radiology Grand Rounds, Pennsylvania Hospital, Philadelphia, PA  
• “Role of nuclear medicine in molecular imaging”

January 30, 2004  
Department of Radiology Grand Rounds, University of Pennsylvania, Philadelphia, PA  
• “Imaging oncogene expression”

March 5, 2004  
Society of Nuclear Medicine Chapter Annual Meeting, Pittsburg, PA  
• “Targeting oncogene expression for imaging breast cancer”

May 17-18, 2004  
Missouri Valley Chapter of the Society of Nuclear Medicine Annual Meeting, St. Louis, MO  
• “Novel radiopharmaceuticals in imaging infection”
June 19-23, 2004  51st Annual Meeting of the Society of Nuclear Medicine, Philadelphia, PA
- "PET imaging of VPCA1 oncogene overexpression with Cu-64-vasoactive intestinal peptide (VIP)"
- "Reparation and evaluation of Tc-99m-peptide-PNA-peptide chimeras for imaging of CCND1 mRNA expression in human breast cancer xenografts"
- "Imaging experimental pulmonary embolism (PE) in swine using fibrin specific peptide Tc-99m-Tp850"

PAMELA VAN TASSEL, M.D.
October 18-19, 2003  Jefferson Spine Imaging Symposium, Philadelphia, PA
- "Neoplasia of the spinal cord and meninges"

ANNINA N. WILKES, M.D.
August 22-25, 2003  Radiologic Society of South Africa, Pretoria, South Africa
- "Breast ultrasound"
- "Fetal echocardiography"
- "Liver ultrasound"
- "Fetal chest sonography"

May 11-14, 2004  The Leading Edge in Diagnostic Ultrasound, sponsored by Thomas Jefferson University Hospital, Atlantic City, NJ
- "Breast ultrasound – Normal and developmental anatomy – Scanning techniques"

ADAM C. ZOGA, M.D.
July 10-16, 2003  International Society for Magnetic Resonance in Medicine 11th Scientific Meeting and Exhibition, Toronto, Canada
- "MRI evaluation of total knee replacement"

October 18-19, 2003  Jefferson Spine Imaging Symposium, Philadelphia, PA
- "Imaging the postoperative spine"

November 30-December 5, 2003  89th Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, IL
- "Etiology of capitae cysts with arthroscopic correlation"
- "MRI of the post Girdlestone hip"
- "MR evaluation of labral tear extent"

February 21-22, 2004  Jefferson Upper Extremity Imaging Symposium, Philadelphia, PA
- "Indirect MR arthrography: Indications, technique and interpretation"

March 7-10, 2004  27th Annual Meeting of the Society of Skeletal Radiology, Tucson, AZ
- "Accuracy of T2 FSE vs STIR sequences in evaluating rotator cuff tears"
OKSANA H. BALTAROWICH, M.D.

- Vice President, Ukrainian Medical Association of North America, Pennsylvania Chapter
- Member, Thyroid Advisory Group for U.S., Belarus and Ukraine Cooperative Studies of Post-Chernobyl Thyroid Disease, National Cancer Institute, National Institutes of Health
- Member, Advisory Board, Ukrainian Medical Association of North America, Pennsylvania Chapter
- Member, Executive Committee, Friends of Radiology in Ukraine
- Member, Advisory Editorial Board, Ukrainian Radiological Journal

DIANE BERGIN, M.D.

- European Award, Best Scientific Paper, Radiology

JOSEPH BONN, M.D.

- Chair, Society of Interventional Radiology Foundation, Society of Interventional Radiology
- Member, Executive Committee, Society of Interventional Radiology
- Member, Clinical Trials Review Committee, National Heart, Lung, and Blood Institute, National Institutes of Health
- Member, Standards of Practice Committee, Society of Interventional Radiology
- Member, Board of Directors, University of Virginia Medical Alumni Association
- Reviewer, Radiology
- Reviewer, Academic Radiology

W. SCOTT ENOCHS, M.D., PH.D.

- Reviewer, Radiology
- Reviewer, Journal of Magnetic Resonance Imaging

DAVID J. ESCHELMAN, M.D.

- Member, Relative Value Update Advisory Committee, Society of Cardiovascular and Interventional Radiology
- Member, Advisory Board, Journal of Vascular and Interventional Radiology
- Associate Editor, Radiology
- Member, Editorial Board, Journal of Vascular and Interventional Radiology
- Examiner, Diagnostic Radiology Examination, American Board of Radiology
- A. Edward O'Hara, M.D. Award for Excellence in Teaching, Department of Radiology, Thomas Jefferson University, 2004

RICK I. FELD, M.D.

- Chair, Membership Committee, American Institute of Ultrasound in Medicine
• Chair, Exam Development Task Force (Abdomen), American Registry of Diagnostic Medical Sonographers
• Member, Executive Board, Philadelphia Roentgen Ray Society
• Member, Ultrasound Section on Human Resources, American College of Radiology
• Member, Advisory Editorial Board, Journal of Ultrasound in Medicine
• Reviewer, Journal of the American Medical Association
• Reviewer, American Journal of Roentgenology
• Reviewer, Clinical Imaging
• Reviewer, Journal of Clinical Ultrasound
• Reviewer, Journal of Ultrasound in Medicine
• Reviewer, Journal of Vascular and Interventional Radiology

ADAM E. FLANDERS, M.D.

• Consultant, Medical Policy, Independence Blue Cross
• Consultant, Medical Review, Independence Blue Cross
• Consultant, Contrast Division, Squibb Diagnostics
• Guest Speaker, Squibb Diagnostics Contrast Speakers' Bureau
• Member, Electronic Communications Committee, Radiological Society of North America
• Member, Scientific Exhibits Award Committee, Radiological Society of North America
• Member, Informatics Committee, American Society of Spine Radiology
• Abstract Reviewer, InfoRad, 89th Scientific Assembly and Annual Meeting of the Radiological Society of North America
• Reviewer, The New England Journal of Medicine
• Reviewer, American Journal of Neuroradiology
• Reviewer, Neuroradiology
• Reviewer, Radiographics
• Reviewer, The Radiological Society of North America Electronic Journal

FLEMING FORSBERG, PH.D.

• Member, Board of Governors, American Institute of Ultrasound in Medicine
• Member, Technical Standards Committee, American Institute of Ultrasound in Medicine
• Member, Advisory Editorial Board, Journal of Ultrasound in Medicine
• Member, Advisory Editorial Board, Ultrasound in Medicine and Biology
• Grant Reviewer, AIUM Research & Education Foundation
• Reviewer, Radiology
• Reviewer, IEEE Transactions on Ultrasonics, Ferroelectrics & Frequency Control
• Reviewer, Circulation
• Reviewer, Journal of Ultrasound in Medicine
• Reviewer, Ultrasound in Medicine and Biology
• Reviewer, Ultrasonics
• Honorable Mention, “On the temperature and concentration dependency of excitation enhanced imaging” (poster), 6th Annual Research Day at Drexel University, Philadelphia, PA, May 2004

DAVID P. FRIEDMAN, M.D.

• Member, Education Committee, American Society of Neuroradiology
• Editorial Board, Current Problems in Diagnostic Radiology
• Reviewer, American Journal of Roentgenology
BARRY B. GOLDBERG, M.D.

- President, Radiology Outreach Foundation
- Felson Memorial Lecturer, 20th Annual Masters Radiology Conference and Hawaii Radiological Society’s Annual Outer Island Meeting, February 2004
- Chair, Archives Committee, American Institute of Ultrasound in Medicine
- Chair, Archives Committee, World Federation for Ultrasound in Medicine and Biology
- Chair, Committee on Ultrasound, American College of Radiology Oncologic Imaging Network
- Chair, Fiftieth Anniversary Committee, American Institute of Ultrasound in Medicine
- Chair, Committee on International Relations and Education, Radiological Society of North America
- Member, Administrative Council, World Federation for Ultrasound in Medicine and Biology
- Member, Global Steering Group for Education and Training in Diagnostic Imaging, World Health Organization
- Member, Presidential Advisory Council, American Institute of Ultrasound in Medicine
- Member, Board of Directors, Breast Cancer and Women’s Health Ultrasound Foundation
- Member, International Organizing Committee, International Congress of the Ultrasonic Examination of the Breast
- Member, Public Information Advisory Board, Radiological Society of North America
- Member, Corporate Advisory Council, Radiological Society of North America
- Member, Education Council, Radiological Society of North America
- Member, Committee on International Relations and Education, Radiological Society of North America
- Member, International Liaison Committee, Ultrasound in Medicine and Biology
- Member, Research and Education Foundation Program Committee, Radiological Society of North America
- Member, Education and Research Fund Committee, American Institute of Ultrasound in Medicine
- Member, Awards Committee, American Institute of Ultrasound in Medicine
- Member, Outstanding Researcher Award Review Panel, Radiological Society of North America Research and Education Foundation
- Member, Centennial Committee, Philadelphia Roentgen Ray Society
- Member, American Institute of Ultrasound in Medicine Past Presidents Committee
- Honorary Life Member, World Federation for Ultrasound in Medicine and Biology
- Honorary Member, Croatian Society for Ultrasound in Medicine and Biology
- Media Spokesperson, American College of Radiology
- Medical Advisor, Ultrasound, World Health Organization
- Medical Advisor, Ultrasonic Procedures, Blue Shield of Pennsylvania
- Consultant, Medicare Professional, Pennsylvania Blue Shield
- Resource Advisor, March of Dimes Birth Defects Foundation
- Associate Editor, Surgical Endoscopy, Ultrasound, and Interventional Techniques
- Member, Editorial Advisory Board, West African Journal of Ultrasound
- Member, Advisory Committee, Ultrasonidos en Medicina
- Member, International Advisory Board, Indian Journal of Medical Ultrasound
- Member, International Advisory Board, Turkish Journal of Diagnostic and Interventional Radiology
- Member, Editorial Board, Journal of Ultrasound in Medicine and Biology
- Member, Editorial Board, Journal of Ultrasound in Medicine
- Member, Editorial Board, Journal of Clinical Ultrasound in Medicine
- Member, Editorial Board, Clinics in Diagnostic Ultrasound
- Member, Editorial Board, Archives of Clinical Imaging
- Member, Editorial Board, Journal of Surgical Ultrasonography
• Member, Editorial Board, *Ultrasound International*
• Member, Editorial Board, *Advances in Echo Enhancement*
• Member, Editorial Board, *Radiologia*
• Member, Editorial Board, *Journal d'Echographie et de Medicine Ultrasonore*
• Member, Editorial Board, *Acta Clinica Croatica*
• Member, Editorial Board, *Journal Ultrasonido*
• Editorial Consultant, *Applied Radiology*
• Editorial Consultant, *Chest*
• Editorial Consultant, *Pediatrics*
• Editorial Consultant, *Medcom Faculty of Medicine*
• Editorial Advisor, *Journal d'Echographie et de Medecine Ultrasonore*
• Overseas Editorial Advisor, *Borno Medical Journal*
• Reviewer, *The New England Journal of Medicine*
• Reviewer, *Cancer*
• Reviewer, *Radiology*
• Reviewer, *Journal of the National Cancer Institute*
• Reviewer, *Gastroenterology*
• Reviewer, *Gastrointestinal Endoscopy*
• Reviewer, *American Journal of Roentgenology*
• Reviewer, *Health Devices*

**CARIN F. GONSALVES, M.D.**

• Distinguished Reviewer, *Journal of Vascular and Interventional Radiology*

**ETHAN J. HALPERN, M.D., M.S.C.E.**

• Dean’s Citation for Faculty Mentoring, Jefferson Medical College
• Member, Genitourinary Working Group for Prostate Cancer, National Institutes of Health
• Member, Prostate US Clinical Guideline Subcommittee, American College of Radiology and American Institute of Ultrasound in Medicine Collaboration
• Associate Editor, *Radiology*
• Reviewer, *Annals of Internal Medicine*
• Reviewer, *American Journal of Roentgenology*
• Reviewer, *Ultrasound in Medicine and Biology*

**CHARLES M. INTENZO, M.D.**

• Associate Editor, *Radiology*
• Reviewer, *American Journal of Roentgenology*
• Reviewer, *Radiographics*

**DAVID KARASICK, M.D.**

• Member, Closed Meeting Case Review Committee, International Skeletal Society
• Editor-in-Chief, *Seminars in Musculoskeletal Radiology*
• Reviewer, *American Journal of Roentgenology*
• Reviewer, *Radiology*
• Reviewer, *Skeletal Radiology*
STEPHEN KARASICK, M.D.
- Examiner, Genitourinary Section, American Board of Radiology
- Examiner, Gastrointestinal Section, American Board of Radiology
- Member, Ad hoc Scientific Exhibit Awards Committee, American Roentgen Ray Society 104th Annual Meeting
- Reviewer, Radiology
- Reviewer, *American Journal of Roentgenology*

SUNG M. KIM, M.D.
- Member, Executive Council, Program Development Education Funding, Society of Nuclear Medicine
- Member, Brain Imaging Council, Society of Nuclear Medicine
- Member, Computer and Instrumentation Council, Society of Nuclear Medicine
- Member, Correlative Imaging Council, Society of Nuclear Medicine
- Member, Membership Committee, Society of Nuclear Medicine
- Reviewer, *Journal of Nuclear Medicine*

ALFRED B. KURTZ, M.D.
- Member, Finance Committee, American Institute of Ultrasound in Medicine
- Member, Editorial Board, *Journal of Ultrasound in Medicine*
- Member, Manuscript Review Panel, *American Journal of Roentgenology*
- Editorial Consultant, Radiology
- Reviewer, Radiographics
- Special Reviewer, *Ultrasound in Medicine and Biology*

SONG LAI, PH.D.
- Grant Reviewer, Brain Disorders & Clinical Neuroscience Study Section, National Institutes of Health
- Grant Reviewer, The National Sciences and Engineering Research Council of Canada
- Reviewer, *Journal of Magnetic Resonance Imaging*
- Reviewer, Magnetic Resonance Imaging
- Reviewer, Magnetic Resonance in Medicine
- Reviewer, NMR in Biomedicine
- Reviewer, NeuroImage
- Reviewer, Human Brain Mapping
- Reviewer, Magnetic Resonance Materials in Biology, Physics and Medicine (MAGMA)
- Reviewer, Stroke
- Reviewer, Medical Physics

ANNA S. LEV-TOAFF, M.D.
- Editorial Board, *Journal of Ultrasound in Medicine*
- Reviewer, Radiology
- Reviewer, *American Journal of Roentgenology*
- Reviewer, *Journal of Ultrasound in Medicine*
- Reviewer, *Ultrasound in Obstetrics and Gynecology*
JI-BIN LIU, M.D.
- Member, Medical Advisory Board, International Certification and Education Accreditation Foundation
- Grant Reviewer, National Natural Science Foundation of China
- Editorial Board, Chinese Journal of Medical Imaging Technology
- Editorial Board, Journal of Ultrasound in Clinical Medicine
- Reviewer, Journal of Ultrasound in Medicine
- Reviewer, Ultrasound in Medicine and Biology
- Reviewer, Journal of Clinical Ultrasound
- Reviewer, Chinese Journal of Ultrasonography

LYNN LUCAS-FEHM, M.D.
- Member, Board of Directors, KePRO, subsidiary of Pennsylvania Medical Society

CHRISTOPHER R.B. MERRITT, M.D.
- President, American Roentgen Ray Society
- Treasurer, World Federation of Ultrasound in Medicine and Biology
- Trustee, American Board of Radiology
- Contributing Editor, Breast Diseases Quarterly
- Consulting Editor, Taveras and Ferrucci. Radiology – Diagnosis, Imaging, Intervention
- Advisory Editor, Ultrasound in Medicine and Biology
- Advisory Editor, Ultrasound Quarterly
- Reviewer, Radiology
- Reviewer, Academic Radiology
- Reviewer, American Journal of Roentgenology
- Named as one of the “Best Doctors in America 2003-2004”

DONALD G. MITCHELL, M.D.
- Chair, Gynecology Disease Site Committee, American College of Radiology Imaging Network
- Chair, Education Committee, Commission on Neuroradiology & Magnetic Resonance, American College of Radiology
- Member, Committee on Research and Technology, Commission on Neuroradiology & Magnetic Resonance, American College of Radiology
- Member, Education Committee, International Society for Magnetic Resonance in Medicine
- Member, Awards Committee, International Society for Magnetic Resonance in Medicine
- Member, Membership Committee, Society of Computed Body Tomography and Magnetic Resonance
- Associate Editor, Journal of Magnetic Resonance Imaging
- Editorial Board, Abdominal Imaging
- Editorial Board, Journal of Computer Assisted Tomography
- Reviewer, Radiology
- Reviewer, American Journal of Roentgenology
- Reviewer, Academic Radiology
- Reviewer, Radiographics
- Editor’s Recognition Award with Distinction, Radiology
WILLIAM B. MORRISON, M.D.

- Member, Expert Panel on Musculoskeletal Radiology, Continuous Professional Improvement Series, American College of Radiology
- Member, Scientific Poster Committee, 89th Assembly and Annual Meeting of the Radiological Society of North America
- Consultant, Scientific Advisory Board, DynaWell International
- Editorial Board, *Seminars in Musculoskeletal Radiology*
- Reviewer, *Radiology*
- Reviewer, *American Journal of Roentgenology*

LEVON N. NAZARIAN, M.D.

- Chair, Musculoskeletal Ultrasound Section, American Institute of Ultrasound in Medicine
- Chair, Committee on Research & Technology Assessment, Commission on Ultrasound, American College of Radiology
- Co-Founder, *Ultrasound Training Centre of Armenia*, Yerevan, Armenia (affiliated with the Jefferson Ultrasound Research and Education Institute)
- Secretary/Treasurer, Global Ultrasound Equipment Donation Foundation
- Liaison, American Registry of Radiologic Technologists Vascular Sonography Exam Committee, Commission of Human Resources, American College of Radiology
- Member, Special Emphasis Panel for PAR-03-125, *Novel Technologies for In Vivo Imaging (SBIR/STIR)*, National Cancer Institute, National Institutes of Health
- Member, Educational Evaluation Committee, American Roentgen Ray Society
- Member, Ultrasound Item Writing Committee, American Board of Radiology
- Member, Council on Sections, American Institute of Ultrasound in Medicine
- Member, Regional Course Committee, American Institute of Ultrasound in Medicine
- Member, Annual Convention Committee, American Institute of Ultrasound in Medicine
- Member, Public Information Advisors Network, Radiological Society of North America
- Member, Publication Committee and Editorial Policy Subcommittee, American Roentgen Ray Society
- Medical Adviser, Public Web Site, Radiological Society of North America – American College of Radiology
- Examiner, Ultrasound, American Board of Radiology
- Associate Editor, *Radiology*
- Member, Advisory Editorial Board, *Journal of Ultrasound in Medicine*
- Member, Editorial Board, *Journal of the British Medical Ultrasound Society*
- Reviewer, *Radiology*
- Reviewer, *American Journal of Roentgenology*
- Reviewer, *Journal of Ultrasound in Medicine*
- Editor’s Recognition Award for Distinction in Reviewing, *Radiology*

LAURENCE NEEDLEMAN, M.D.

- Chair, Corporate Affairs Committee, Society of Radiologists in Ultrasound
- Chair, Technologist Advisory Committee, Philadelphia Roentgen Ray Society
- Chair, Committee on Bylaws, Philadelphia Roentgen Ray Society
- Vice-Chair, Program Committee, Society of Radiologists in Ultrasound
- Assistant Chair, Regional Course Committee, American Institute of Ultrasound in Medicine
- Member, Board of Directors, Intersocietal Commission on Accreditation of Vascular Laboratories
- Member, Commission on Standards (Commission on Ultrasound), American College of Radiology
- Member, Clinical Standards Committee, American Institute of Ultrasound in Medicine
• Member, Committee on Ultrasonography, Pennsylvania Radiological Society
• Member, Editorial Board, *Journal of Ultrasound in Medicine*
• Reviewer, Ultrasound Accreditation, American College of Radiology
• Occasional Reviewer, *Cancer*

PATRICK L. O'KANE, M.D.

• President, Greater Delaware Valley Ultrasound Society
• Consultant, NIH Trinational Chernobyl Project

CATHARINE W. PICCOLI, M.D.

• Member, Committee on Standards and Accreditation, Commission on Ultrasound, American College of Radiology
• Member, Clinical Image Reviewer Subcommittee, Mammography Accreditation Program, American College of Radiology
• Member, Institutional Review Board, *American College of Radiology*
• Member, Committee on Mammography, The Pennsylvania Radiological Society
• Reviewer, *Radiology*
• Reviewer, *American Journal of Roentgenology*
• Reviewer, *Ultrasound in Medicine and Biology*

VIJAY M. RAO, M.D.

• President-Elect, American Society of Head and Neck Radiology
• Member, Board of Directors, Association of Program Directors in Radiology
• Member, Executive Committee, American Society of Head and Neck Radiology
• Chair, Research and Education Program Committee, Radiological Society of North America
• Member, Academic Council, Consortium of Society of Chairmen in Academic Radiology Departments/Association of Program Directors in Radiology/Association of University Radiologists/Radiological Society of North America
• Member, Editorial Board, *Journal of the American College of Radiology*
• Member, Committee on Government Issues, Association of Program Directors in Radiology
• Member, Research Committee, American Society of Neuroradiology
• Member, Scientific Program Committee of the RSNA
• Reviewer, Scientific Abstracts, 89th Scientific Assembly and Annual Meeting of the Radiological Society of North America
• Reviewer, Scientific Exhibits, 89th Scientific Assembly and Annual Meeting of the Radiological Society of North America
• Reviewer, Scientific Abstracts, Association of University Radiologists 52nd Annual Meeting
• Reviewer, Scientific Abstracts, American Society of Head and Neck Radiology 37th Annual Meeting
• Reviewer, Scientific Abstracts, 42nd Annual Meeting of the American Society of Neuroradiology
• Reviewer, *Radiology*
• Reviewer, *American Journal of Neuroradiology*
• Reviewer, *Neuroradiology*
• Reviewer, *American Journal of Roentgenology*
• Reviewer, *Academic Radiology*
• Reviewer, *Radiographics*
• Reviewer, *Journal of the American College of Radiology*
• Editor's Certificate of Recognition for Review of Manuscripts, *Radiographics*
• Editors Certificate of Recognition for Review of Scientific Exhibits, *Radiographics*

**SHARON SEGAL, M.D.**

• Member, Continuing Medical Education Committee, American Osteopathic College of Radiology

**LISA M. TARTAGLINO, M.D.**

• Member, Finance Committee, Association of Program Directors in Radiology
• Reviewer, *Radiology*

**MATHEW L. THAKUR, PH.D.**

• President, Society of Nuclear Medicine
• Delegate-at-Large, Society of Nuclear Medicine
• Chair, Young Investigators Award Committee, International Society of Radiolabeled Blood Elements
• Chair, Molecular Imaging Task Force, Society of Nuclear Medicine
• Chair, International Task Force, Society of Nuclear Medicine
• Chair, 50th Anniversary Committee, Society of Nuclear Medicine
• Lead Member, National Radionuclide Availability Task Force, Society of Nuclear Medicine
• Member, Board of Governors, Greater New York Chapter, Society of Nuclear Medicine
• Member, Board of Directors, Society of Nuclear Medicine
• Member, Financial Committee, Society of Nuclear Medicine
• Member, Education Research Committee, Society of Nuclear Medicine
• Member, Advisory Committee, US Pharmacopea
• Member, Advisory Committee, Kuwait Medical Research Council
• Member, Advisory Committee, International Atomic Energy Agency
• Member, Advisory Committee, Laurence Berkeley National Laboratory
• Member, International Science Committee, International Society of Radiolabeled Blood Elements
• Member, Scientific Program Committee, World Federation of Nuclear Medicine and Biology
• Member, Site Visit Committee, National Institutes of Health
• *Ad hoc* Grant Reviewer, National Institutes of Health
• Grant Reviewer, Canadian Medical Research Council
• Grant Reviewer, Austrian Foundation for Medical Research
• Member, Editorial Board, *Journal of Labelled Compounds and Radiopharmaceuticals*
• Member, Editorial Board, *Journal of Nuclear Medicine*
• Member, Editorial Board, *Journal of Nuclear Medicine and Biology*
• Member, Editorial Board, *European Journal of Nuclear Medicine*
• Member, Editorial Board, *Journal of the Indian Association of Clinical Medicine*
• Member, Editorial Board, *Nuclear Medicine Communications*
• Member, Editorial Board, *Journal of the Association of Latin American Societies of Nuclear Medicine and Biology*
• Member, Editorial Board, *Spanish Journal of Nuclear Medicine*
• Reviewer, *European Journal of Nuclear Medicine*
• Reviewer, *Journal of Labelled Compounds and Radiopharmaceuticals*
• Reviewer, *Journal of Nuclear Medicine*
• Reviewer, *Journal of Nuclear Medicine and Biology*
• Reviewer, *Nuclear Medicine Communications*
• Reviewer, Post Graduate Medical Journal (London, England)
• Organizer, Continuing Medication Education, World Federation of Nuclear Medicine and Biology
ANNINA N. WILKES, M.D.

- State Director, American Women's Association
- Member, Women's Health Committee, American Medical Women's Association
- Member, Medical Advisory Board, Linda Creed Breast Cancer Foundation
- International Visiting Professor, Radiologic Society of North America
APPENDIX

Table 1    ACTIVE GRANTS
Table 2    PENDING GRANTS
### NIH/OTHER FEDERAL GRANTS

<table>
<thead>
<tr>
<th>PRINCIPAL INVESTIGATOR</th>
<th>TITLE OF PROJECT</th>
<th>FUNDING SOURCE</th>
<th>FUNDING DATES</th>
<th>DIRECT COSTS</th>
<th>INDIRECT COSTS</th>
<th>TOTAL COSTS FUNDED</th>
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<tbody>
<tr>
<td>Forsberg, F. C10101</td>
<td>Nanotechnology Delivery Team: Targeted Delivery of Biomolecules</td>
<td>Ben Franklin Technology Center of Southeastern Pennsylvania</td>
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<td>Contrast-Enhanced US Detection of Angiogenesis</td>
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<td>Estimation of Tumor Angiogenesis with Contrast Enhanced Subharmonnic Ultrasound Imaging</td>
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<td>Developing of Tissue Characterization Methods</td>
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**Active Grants**  
07/01/03 - 06/30/04  
(Rpt reflects entire award period and current fiscal year of award)
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<tr>
<th>Name</th>
<th>Description</th>
<th>Sponsor</th>
<th>Funding Period</th>
<th>Current Fiscal Year Amount</th>
<th>Previous Fiscal Year Amount</th>
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<td>Goldberg, B.</td>
<td>American College of Radiology Cooperative Group: Mechanism of the ACR Imaging Network</td>
<td>NIH thru ACRIN</td>
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<td>Role of Radiology in the Pretreatment Evaluation of Invasive Cervical Cancer</td>
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<td>NIH thru VueSonix</td>
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<td>MRI Evaluation of the Contralateral Breast in Women with a Recent Diagnosis of Breast Cancer</td>
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<td>Commonwealth of Pennsylvania Department of Health</td>
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<td>05/01/04 - 04/30/08</td>
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<td>Health Resources and Services Administration 4 C76 HF00170-01</td>
<td>Health Care Facilities and Other Construction</td>
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<td>NIH (SBIR) thru Palatin Technologies 2 R42 HL59769</td>
<td>Imaging Thromboembolism with Fibrin Avid Tc-99m-Peptide</td>
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<td>A Phase I/II Study of Percutaneous Radiofrequency Ablation of Bone Metastases Using CT Guidance</td>
<td>01/01/02 - 12/31/04</td>
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# FOUNDATION/NON-PROFIT ORGANIZATION GRANTS

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<tr>
<th>PRINCIPAL INVESTIGATOR</th>
<th>TITLE OF PROJECT</th>
<th>FUNDING SOURCE</th>
<th>FUNDING DATES</th>
<th>DIRECT COSTS</th>
<th>INDIRECT COSTS</th>
<th>TOTAL COSTS FUNDED</th>
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<td>Teach the Teachers</td>
<td>Radiologic Society of North America</td>
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<td>Breast Health Institute</td>
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<td>Society of Radiologists in Ultrasound</td>
<td>01/01/03 - 06/08/05</td>
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<td>Breast Health Institute</td>
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| TOTAL NON-PROFIT FUNDING   | $649,941 | $9,620 | $659,561 |

<p>| CURRENT YEAR NON-PROFIT FUNDING | $195,526 | $6,476 | $202,002 | (current fiscal yr) |
|                                | $195,526 | $6,476 | $202,002 | (current fiscal yr) |</p>
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<th>PRINCIPAL INVESTIGATOR</th>
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<th>FUNDING DATES</th>
<th>DIRECT COSTS</th>
<th>INDIRECT COSTS</th>
<th>TOTAL COSTS FUNDED</th>
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<td>Flanders, A. A53601</td>
<td>Optimized Harmonic Imaging with Contrast (Loqi 700)</td>
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<td>Evaluation of Acute Stroke Patients with Perfusion CT</td>
<td>Philips Medical Systems</td>
<td>08/06/03 - 08/05/05</td>
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*Report reflects entire award period and current fiscal year of award**
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## Pending Grants
07/01/03 - 06/30/04
(Report reflects entire award period and first year of award)

### FOUNDATION/NON-PROFIT ORGANIZATION GRANTS

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**TOTAL NON-PROFIT FUNDING**
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- $569
- $16,254

**TOTAL FIRST YEAR NON-PROFIT FUNDING**
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- $569
- $16,254
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**INDUSTRIAL GRANTS**

*Report reflects entire award period and first year of award.*
Coronary CT angiography with multi-slice CT

Transverse view of an implanted pancreatic tumor on the right flank of a mouse imaged with the animal PET-CT system.